

# COMPUTERWORLD

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## SEASON'S GREETINGS

### NCC Board Votes to Keep Annual Format

ARLINGTON, Va. — The National Computer Conference will continue to be held on an annual basis rather than return to a semiannual format, the conference's board of directors announced recently.

"The basic premise is that the industry could not and should not be asked to support a conference such as NCC twice a year," according to Robert Marrigan, board chairman and vice-president of Mail Communications, Inc. in Everett, Mass. The decision was announced to end recent speculation about an expanded conference schedule as well as to put to rest suggestions that NCC return to the Spring and Fall Joint Computer Conference schedule, he said.

NCC has become so large in recent years that recommendations were made to hold smaller conferences twice a year. But "the NCC board feels that one diverse, annual NCC augmented by additional conferences such as the [American Federation of Information Processing Societies'] Office Automation Conference will better serve the needs of the information processing community," Marrigan stated.

To offset the growth of NCC, the number of conference sessions will be reduced to enable attendees to derive greater benefit from the themes and concepts being presented, he said.

NCC's annual format was established in 1973 to revitalize the health of the Spring and Fall Joints. At that time, the program was revamped to allow more application-oriented sessions.

It was also at that time that the decision was made to hold the conference only in major metropolitan centers.

The 1980 NCC will be held in Anaheim, Calif., on May 19-22.

### Better Late Than Never?

By Tim Scannell  
CW Staff

ATLANTA — IBM will begin customer shipments of its System/38 small business computer some time in July, nearly a year after its originally scheduled release date, the company announced last week.

At the same time, it also announced increased main memory capacities for the long-awaited System/38 and expanded main memory and disk storage capacities for the System/34.

The firm decided to push back the System/38's August 1979 delivery date "to permit additional integration and testing of the [minicomputer's] advanced programming elements" that were preventing the CPU from achieving planned performance levels, according to a spokesman here at IBM's General Systems Division. While the System/38 is reportedly rated at about four times the power of the System/3, these programming problems were forcing the company's newer machine to work on approximately the same plateau as its predecessor, sources indicated.

Although IBM denies it, a number of people familiar with the System/38 claimed the processor's problems went beyond the need for simple "integration" and re-

volved around the operating system itself [CW, Aug. 13]. Extremely complex and inundated with various command and parameter levels, the computer's advanced operating system not only hurt system performance as a whole, but required a huge chunk of CPU time, sources said.

While the IBM spokesman agreed the System/38's operating system is "very, very complex," he noted that all of the machine's CPU-related difficulties have been eliminated and the system is "working just fine now."

#### Beefed-Up Storage

In an effort to keep up with rising user requirements and demands, the firm boosted the main storage capacities of the System/38. The Model 3 unit is now provided with either 1.2M or 1.5M bytes, compared with the previously announced maximum of 1M byte. The Model 5 has storage capacities of 1.7M and 2M bytes, instead of a maximum of 1.5M bytes, the spokesman said.

Prices for the beefed-up 38s vary depending on the amount of disk storage provided with each system. For instance, a Model 3 with 1.2M bytes of main storage

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### House Unwraps New Rewrite of 1934 Act

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — A new rewrite of the Communications Act of 1934 was unveiled in the House of Representatives last week. Endorsed by all members of the Communications Subcommittee, headed by Rep. Lionel Van Deerlin (D-Calif.), the bill hews closely to recommendations of the President's chief telecommunications advisor, Henry Geller.

As a result, several of the bill's sponsors predicted that Congress will enact legislation replacing the outmoded 1934 act before the end of next year. The rewrite effort began nearly four years ago.

However, some key differences exist

between the new House bill, H.R. 6121, and the latest Senate proposal, S. 611, to revise the Communications Act.

- Under the Senate bill, AT&T must offer long-distance (interchange) and local telephone network services through fully separated subsidiaries before it can begin marketing DP and other on-line information services. Also, AT&T must produce and market terminal equipment through subsidiaries fully separated from its operating companies.

The House bill, by comparison, requires that AT&T's marketing — not production — of terminal equipment must be separated. On-line information services must also be separated,

but not local and long-distance telephone network offerings.

- Although both bills require the Federal Communications Commission (FCC) to regulate "dominant carriers," they define the term differently. In the House version, a dominant carrier is one having the ability, "in a substantial percentage of [its] markets, to raise or lower prices ... without significantly affecting [demand]."

S. 611 says a dominant [Category II] carrier is one that received 3% or more of all interexchange revenues in the year preceding enactment of the bill and "is not subject to effective competition."

- The Senate bill would impose much more specific restrictions than the House measure on AT&T's provision of DP and other on-line information services. Within six months after enactment of S. 611, for example, the FCC would have to adopt regulations providing for "separated pricing, on a fully compensated basis, of telecommunications equipment, information software or information services ... offered in conjunction with a telecommunications service by any carrier not subject to effective competition."

H.R. 6121 requires only that such services and equipment be offered through fully separated subsidiaries and that the related costs not be subsidized by revenues earned from other services.

At press time, computer industry trade associations active in the Com-

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### Orders for 4300, 8100 CPUs May Shrink

By Tom Henkel

CW Staff

BOSTON — IBM's formidable backlog of orders for 4300 and 8100 CPUs may soon dwindle, according to a recent survey of 75 Fortune 500 firms.

Although it was attacked by some industry observers as too small a sampling to be of any significance, the survey found 36% of users with 4341s on order will cancel them. In addition, 33% of 4331 orders and 33% of 8100 orders will be canceled, according to Ray Newstead, program director for the Yankee Group, the consulting firm here that conducted the study.

According to the Yankee Group,

IBM predicted a 75% to 80% placement of 4300 and 8100 orders. However, IBM denied ever making such a prediction.

#### Other Systems Ordered

A large portion of the surveyed users who said they plan to cancel 4300 or 8100 orders had ordered other IBM systems at the same time. They decided to take delivery of the other systems, according to Newstead.

However, many of the users who ordered only 4300 or 8100 CPUs will cancel those orders as a result of high software costs associated with those systems, the Yankee Group reported.

The survey divided participants into two categories, "banking and insurance" users and "manufacturing" users.

In the banking and insurance category, an overwhelming 98% said they will refuse delivery of a 4341. Thirty-three percent plan to refuse delivery on 4331s and 28% will refuse ordered 8100s, according to Newstead.

Among companies categorized as manufacturers, 45% plan to refuse 4331 deliveries, 36% to refuse 4341s and 39% to refuse 8100s.

The Yankee Group said the survey represented a total of 145 IBM sys-

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## With CRT 'Helpers' Gift Registry System Clues Santa

By Jay Woodruff

CW Staff

MINNEAPOLIS — Santa is getting help selecting just what people want for Christmas this year through a computerized gift registry system installed in a department store chain here.

The system was put together through the collaboration of Dayton's department stores, Northwestern Bell Telephone, a "touch-screen" CRT terminal manufacturer and a software house.

The touch-screen CRTs have been installed in Dayton's nine stores in the Minneapolis-St. Paul area and in three stores in North and South Dakota. Shoppers are invited to use the terminals to find out what their friends, relatives and national and regional celebrities want for Christmas.

To use the system, the shopper touches the screen of an Information Dialogues, Inc. (IDI) Model TST-180 Touch-Sensitive terminal. The 15-in. diagonal CRT immediately begins a "conversation" with the shopper.

The shopper is first asked to select from four categories of gift recipients: national and local celebrities, sports figures, politicians and friends and relatives. Once the shopper has picked the desired category, the TST-180 transmits the information over phone lines to a Data General Corp. Eclipse minicomputer system run by a service company called Systems Integration, Inc. in St. Louis Park, Minn.

That group agreed to participate because it wrote the software (called Medtech) for the touch-screens and already provides DP services to area hospitals that use TST-180 terminals. Communications over the phone lines utilize 30 phone company Dataphone modems.

An Intel Corp. 8080 microprocessor was used by IDI as a front end for certain preprocessing functions such as retrieving touch codes and verifying them before routing to the CPU. Each TST-180 is also run by an 8080, according to Ernie Stonebraker, IDI's director of software development.

To compile the registry, Dayton's asked about 30,000 charge customers, as well as customers who visited its



He's making a list . . . Using his North Pole data base and a Christmas Registry Computer, Santa Claus does a little last-minute gift checking for two anxious tots at Dayton's department stores in Minneapolis.

stores, to fill out forms listing their Christmas wishes. Charitable organizations in the area were also asked for their gift lists, according to IDI President Fred Katter, who contributed the 15 terminals.

If a user wants information on someone whose last name is Smith, for example, the CRT displays all the Smiths who have registered. When the right Smith is found, the user needs only to touch the name on the screen, and the system displays a copy of the form

filled out by the hopeful gift recipient.

The form will show three gifts that the registrant "would love to find" under the Christmas tree, favorite colors and no-so-favorite colors, clothing sizes — and those gifts that the registrant definitely does not want for Christmas, according to a Dayton's spokeswoman.

In the Minneapolis-St. Paul downtown stores, the user can command an adjacent phone company printer to print a hard copy of the list.

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## PRESS REPORT

NORTH POLE, Dec. 29, 1979 — The founder and chief executive officer of S. Claus & Co., the world's largest distributor of gifts, confirmed today that his company had experienced "some computer problems" on the night of December 24.

But Mr. Claus denied that there had ever been any danger that gifts would not be delivered until after the holiday season. "As usual, the press has blown this matter out of all proportion," he said. "Sure, we had some problems with year-end runs, but what data processor doesn't?"

Questioned as to the nature of the problem, Mr. Claus said that it was caused by a "half-baked" sort program. "When I walked into the computer room on the 24th, I naturally expected that the gifts would all be sorted out and the lists made up."

Instead, he said that he found none of the cargo ready to be loaded aboard the sleigh. "When I questioned the Chief Elf, he told me that he had acquired a 'new and improved' sort program."

"Well, it may have been new but it certainly wasn't improved. It was gobbling up our CPU Time like there was no tomorrow. Our volume has increased tremendously since last year, and as a result our computer system was clogged up like a drainpipe full of hair."

Mr. Claus refused to identify the sort program. But he did say that "it is the kind of sort often made by hardware companies in their spare time."

The jolly but hard-driving executive credited a junior elf on his staff for solving the problem. "We were all standing around wondering what to do when he said, 'Why don't you look in that pile of unsorted presents over there? Maybe you'll be lucky enough to find a SyncSort!'"

Mr. Claus chuckled as he recalled the incident. "Here we were, a bunch of PhD's in computer science, and it was this kid who came up with the answer. Well, we found a SyncSort and installed it. Before you could say Donner and Blitzen, the gifts were sorted and the sleigh loaded."

Mr. Claus indicated that the SyncSort program is produced by Whitlow Computer Systems of Englewood Cliffs, N.J. "I deliver a lot of things there every year," he said. "I know they're a good company because they keep a nice clean chimney."

Asked about the fate of the sort program that had caused the problem, Mr. Claus said that it had been sent to the company's factory in the Black Forest. "It can't do too much harm there," he said.

The Black Forest facility specializes in the production of Pinocchio dolls.



# Representatives May Get Terminals

## Automation Making Assault on House Members

By Jake Kirchner

CW Staff

WASHINGTON, D.C. — The House of Representatives, for years the scene of creeping computerization, is being set up for a direct automation assault on its most unguarded front: the congressmen themselves.

The House Policy Group on Information and Computers, led by its chairman, Rep. Charles Rose (D.-N.C.), the patriarch of congressional computing, wants to move data terminals out of Capitol Hill staff warrens and into the members' own offices.

At a recent meeting of the Policy Group and House Information Systems (HIS) staff, Rose said now that HIS has been successful in introducing automation into the majority of House offices, he would like to see members themselves drawn into direct computer use.

"I want to find data bases that members of Congress would fiddle with," he said during a discussion of the on-line data bases now available through the Member Information Network (MIN).

MIN offerings presently include the Legislation Information and Status (Legis) data base, which provides information on bills and resolutions, amendments, Presidential communications and petitions, and the Summary of Proceedings and Debates (Sopad), which monitors action on the House floor, summarizes debates, lists floor

schedules, legislation and amendments slated for discussion and summarizes House voting.

Now tied into MIN are 332 member offices, up from 189 at the beginning of the year, with 1,500 staffers having access to the system. HIS has been particularly busy with the offices of new members; over 95% of all congressmen who took office last year now have "some type of computer system," it reported.

### No Sex Appeal

But even with increased MIN use, too many offices are interested only in equipment and services to improve office management and word processing to increase productivity, Rose said. He worried aloud that although some of the HIS data bases are of great assistance to Hill staffers, the files are not "sexy" enough to lure the members to their office CRTs.

Rose wants HIS to worry less about automating office operations, a large part of its work, and start providing more services that will be of direct use to the lawmakers.

The Policy Group should be concerned with "bringing good, relevant information quickly to members' attention rather than stuffing their envelopes" through the latest word processing equipment, according to Rose. "The political realities of this place are heavily involved with current information," Rose said, arguing that

congressmen, if they would only learn the ropes of computer usage, would find a wealth of information through on-line commercial data bases, which eventually would be available free of charge through MIN if Rose has his way.

"The types of information available continue to amaze me," he said. He referred to his home use of a \$2,000 personal computer system based on a Radio Shack TRS-80, noting he recently accessed United Press International's on-line news service and found one week of upcoming columns by Jack Anderson.

Data bases like that are "an incredible tool," he said, suggesting that many congressmen would find them useful if they were just initiated into their use. He also suggested that if he printed one of Anderson's columns and a rebuttal in the *Congressional Record* several days before the column appeared in the newspaper, "that

might get the brothers interested" in computer use.

### Attractive Fringe Benefit

There is, Rose added, a very attractive fringe benefit for those congressmen who move into the ranks of the computer literati — reelection assistance. While House office computers cannot be put to direct political use, Rose said he uses his home computer to store voter mailing lists for his reelection campaign.

"It's a chicken and egg problem," he concluded. If HIS can offer more and exciting services, more members will become interested in using computers themselves for business and personal applications.

Although "it may take 20 years," Rose is committed to change that stalemate and under his leadership HIS will be moving to make computerization just a little bit sexier, a little more enticing to congressmen.

## House Unwraps Rewrite Bill

(Continued from Page 1)

munications Act rewrite debate were still "studying the bill" — meaning they hadn't had a chance to clear any substantive statements with their members.

Off the record, however, industry sources indicated they are not terribly impressed with H.R. 6121. They contend its failure to separate Bell's long-distance and local exchange services, and its companion failure to split off Western Electric Co. from the operating companies, serious weaknesses.

These sources agree there is a chance legislation will get through the House and Senate next year — assuming AT&T and the rural telephone companies are agreeable, which is not certain at the moment — but they do not think the remaining differences between the two congressional branches can be resolved in that time.

### AT&T Position

AT&T apparently has similar reservations, although it tried to be more optimistic.

AT&T Vice-President James E. Olson said his company is "troubled by some of the language in the House bill," but Bell's "initial reaction is that it appears to be a better piece of legislation than its predecessors."

Among AT&T's "particular" concerns, Olson explained, "is the legislative language dealing with . . . the lifting of the [1956] consent decree . . . An additional area of concern is the enormity of the problem accompanying the massive restructuring that the legislation contemplates."

"But with the introduction of a new House bill and the Senate's plan to have a bill ready for markup early next year, we are undoubtedly closer than ever to the enactment of a new national telecommunications law . . . We hope that 1980 will see the passage of such legislation," Olson added.

The House Communications Subcommittee plans to begin its final consideration, or markup, of H.R. 6121 on Jan. 23. Because the entire membership of the subcommittee has already endorsed the present draft, this activity is expected to take no more than a day or

two.

The next step will be for the full House Commerce Committee to pass H.R. 6121, and this also is not expected to take very long. After the committee acts, the bill will go to the floor for a vote by the full House membership.

When that occurs depends partly on how much pressure is mounted by the committee, but largely on how much other legislation is in the queue.

## IBM Slates July For System/38

(Continued from Page 1)

and 387.1M bytes of disk storage costs \$137,810 or leases for \$3,625/mo. A Model 5 system with 1.7M bytes of main storage and a 387.1M byte disk configuration costs \$194,245 or \$4,900/mo.

The enhanced System/34s feature doubled main storage — 256K bytes — and either 192.9M or 257.4M bytes of disk storage. The former maximum disk capacity was 128.4M bytes, the spokesman stated.

With 256K bytes of main storage and 192.9M bytes of disk storage, the System/34 can be purchased for \$76,290 or leased for a monthly fee of \$2,627.

Shipments for additional System/34 main storage will begin in February 1981, while additional disk storage deliveries are targeted for about the third quarter of 1981.

Finally, IBM announced that shipments of the 3770 direct access storage device intended for use with the System/38 will also begin some time in July. The storage device is currently used on some models of the firm's 4300 series processor and can be used to expand the disk storage capacity of the 38 to up to 2.6G bytes, a spokesman said.

A primary 3770 unit costs \$35,110 and leases for \$900/mo, while additional slave units — the System/38 can handle several — sell for \$23,400 and lease for \$600/mo.

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# Analyst Predicts Lean Years for PCM Vendors

By Tom Henkel  
CW Staff

BOSTON — There are some lean years ahead for vendors that make IBM plug-compatible hardware, according to one industry analyst here.

IBM's new hard-line approach to plug-compatible manufacturers (PCM) will have its biggest impact on smaller makers of processors and main memory vendors. Large mainframes that make IBM-compatible CPUs won't have as rough a time, but they will have to settle for lower profits to survive, a recent report released by the Yankee Group here said.

## IBM Backlog May Dwindle

(Continued from Page 1)

tems, but Newstead could not explain how those systems were distributed among the 75 polled. The consulting firm, however, said its survey represents 1% of total 4300 and 8100 orders.

Another IBM watcher, Robert Fertig, vice-president of Advanced Computer Techniques Corp., said IBM would be fortunate to be in the position in which the Yankee Group survey placed it. With about 60,000 worldwide orders for 4300 series CPUs and about 70,000 orders for 8100 machines, IBM would be hard-pressed to fill even half those orders, he explained.

Taking the 4300 line as an example, Fertig theorized that if IBM worked at top capacity for the next five years, it could churn out only about 6,000 machines a year — or 30,000 machines. Therefore, if the Yankee Group survey is correct, IBM anticipated its real market for 4300 systems perfectly, according to Fertig.

IBM doesn't want to have to step up production of either the 4300 or 8100 because it wants to have workers and factory space available to build bigger, cheaper and possibly better machines, Fertig believes. The long-rumored H series and a high end addition to the 4300 series — one with a rating 1.4 million instruction/sec — are just two examples of machines he said IBM would prefer to build.

The high-end addition to the 4300 line, which Fertig called the 4351, is expected to be announced this spring. That announcement should cause even more cancellations of 4341s, Fertig said.

"IBM is doing a factory balancing act here. The more machines it can spread over more factories, the more production capacity it will have," Fertig said.

In response to the Yankee Group's claim that many prospective 4300 and 8100 users will cancel orders because of high software costs associated with those machines, Fertig said it is still cheaper for users to run newer IBM equipment.

Although he agreed software costs more, the added cost is offset by the reduced power, maintenance and space requirements of the 4300 and 8100.

Users who switch from a 370/148 to a 4341 will save an estimated 30% in maintenance, power and space costs over a five-year period. Users converting from a 370/138 to a 4331 will save an estimated 60% in the same time period, Fertig said.

IBM's latest market strategy will more than make up for its past mistakes of letting both PCMs and main memory vendors have too much of the hardware market, according to Ray Newstead, program director for the Yankee Group.

"Low and mid-range 370 plug-compatible mainframe makers will be impacted by the 4300 — particularly the 4331. Processor vendors, however, should be able to match the 4341 price/performance without too much difficulty, but they will be faced with the enhanced microcode dilemma, which could limit their performance relative to the 4300," the report said.

Large PCMs have not yet been affected by the 4300, but they will soon feel the pinch if IBM cuts prices on

370 and 30 series mainframes. In that case, "their profit margins will suffer and they will experience problems in meeting new volume requirements and managing short-term cash flow as customers shift," the report said.

Vendors of plug-compatible main memories will be hardest hit by IBM's new market strategy, the consulting firm predicted. For some, that strategy will prove fatal.

Smaller main memory vendors are likely to bite the dust if IBM drastically cuts main memory prices on 370 and 30 series hardware, Newstead said.

"PCM main memory makers have been temporarily resurrected until the current 370 and 30 series add-on memory price of \$75,000 per 1M byte is re-

duced to meet or come closer to the \$15,000-per-1M-byte 4300 price," the report said. The only thing that will save many add-on memory vendors is a midway price cut by IBM to \$30,000 to \$40,000 for 1M byte of storage, according to the Yankee Group.

To make matters worse, the memory vendors won't be able to move into the 4300 market for a few more years unless IBM has drastic delivery delays, according to the report.

The key to PCM survival will be innovative research and development at the chip level, Newstead believes. IBM's unsurpassable R&D budget, which turned out the innovative 64K chips, will undoubtedly keep making possible such releases in the years to come, he said.

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# FCC Actions Promise Lower International Rates

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — International data communications services promise to become significantly cheaper in the wake of Federal Communications Commission (FCC) decisions on Dec. 12. It was on that day that the FCC:

- Authorized AT&T to offer international Dataphone service.
  - Permitted U.S. international record carriers (IRC) to provide alternate voice and data services on Datel circuits.
  - Established 21 additional gateway cities where the IRCs can offer switched data services directly instead of via domestic carriers. Among these services are Datel and usage-sensitive, packet-switched offerings such as ITT World Communications, Inc.'s Universal Data Transfer Service (UDTS).
- The 21 newly authorized "domestic service areas," together with the five long-established ones — New York, Washington, D.C., Miami, New Orleans and San Francisco — encompass all of the nation's major population centers.
- Let Western Union Telegraph Co. continue providing cut-rate International Telex service via Canada and Mexico.
  - Required interconnection of all International Telex networks with domestic Telex/TWX facilities.

## Pro-Consumer Policies

"The commission has today adopted more pro-consumer policies in the field of international communications than we have at any time since the FCC came into existence more than 45 years ago," FCC Chairman Charles D. Ferris said. He indicated that further action along the same line is likely.

"I believe we should begin rethinking past FCC decisions which seem to have the effect of separating potential competitors from one another. Current facilities ownership arrangements, present restrictions on types of third-party uses of international lines and

the continuation of the distinction between record and voice services may all be examples of issues ripe for reevaluation," Ferris said.

The commission's authorization of Western Union's International Telex service illustrates how the Dec. 12 decisions will benefit users. This service, which began last October, reduces rates to 19 countries by as much as 30%. Messages are routed overseas via Canada or Mexico [CW, Nov. 12].

The U.S. IRCs have fought the service since its inception, and ITT has asked the federal district court in New York City to enjoin the telegraph company from offering it. The FCC decision greatly reduces that possibility.

## Cheaper, Simpler Access

The commission's decision requiring interconnection among domestic and international Telex/TWX networks should give many users cheaper, simpler

access to overseas circuits. Under the present scheme, a typical user can get an essentially free connection to a particular IRC's switching center, but can use this facility to communicate only with the countries served by that carrier.

In addition, under an FCC ruling adopted last month, the user pays the IRC substantially less for each message if it provides its own access circuits [CW, Nov. 12].

To send or receive messages via multiple IRCs, the user must lease a domestic Telex/TWX circuit from Western Union, make long-distance telephone calls or lease multiple private-line circuits. In addition, he may also need multiple terminals.

While the user that provides its own access pays the IRC less for service, the extra cost of that access — particularly for customers with small traffic volumes — is apt to be far more than

the savings. The FCC's interconnect decision gets around this problem by enabling the customer to access all the IRCs through a single circuit link to one of them.

Adding 21 gateway cities to the five already authorized should spread the savings further. It will greatly increase the number of international Datel customers who can reach an IRC via local telephone networks rather than a long-distance circuit.

The chief result of the Dataphone and Datel decisions will be to permit transmission of voice and data traffic over a common message path, reducing costs by reducing the need for separate transmission facilities. Court challenges of at least some of these decisions are a distinct possibility, however, because all of them relate to controversies that have been raging at the FCC for many years.

## Loses Transmission Control Postal Service Ecom Suffers Setback

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — The U.S. Postal Rate Commission last week sided with commercial vendors of on-line message services in their protracted fight with the Postal Service over its proposed Electronic Computer-Originated Mail (Ecom) system.

The commission ruled that the Postal Service can offer Ecom provided it performs only a physical delivery function and allows commercial vendors to supply, as well as control, the on-line transmission of Ecom messages.

This arrangement would eliminate the need for the U.S. Postal Service to become a communications carrier, as demanded by the Federal Communications Commission [CW, Aug. 6]. But

Postmaster General William Bolger has made it clear that the Postal Service — though willing to do business with multiple carriers — still wants to lease circuits from the carriers and resell them as part of an end-to-end Ecom service package under exclusive post office control.

## Mass Mailing Service

Ecom would provide department stores, utilities, credit card companies and other mass mailers with quicker delivery of monthly statements and other money-related documents than first-class mail now provides. The service would be limited to firms that send a minimum of 5,000 messages per month.

Recorded initially on magnetic tape, the messages would be transmitted on-line from the user's premises to each

destination ("serving") post office, converted by on-line printing equipment into hard copy at that point and delivered to the recipient by mail carrier within two days after input. Ecom would interconnect the nation's 25 largest cities.

The Postal Rate Commission said a majority of its members believe that a "decentralized" service — limiting the Postal Service to conversion and physical delivery of Ecom messages received on-line from communications carriers — will promote lower costs and greater competition than the Postal Service's "centralized" plan, while eliminating "the possibility of jurisdictional disputes."

The commission added, however, that under its recommended decision, the Postal Service would not be "precluded from providing future customer-to-postal computer communications (assuming necessary regulatory approval) through electronic telecommunications controlled by it." Also, the decision "provides for renewed consideration of the Ecom issue in later . . . proceedings, once practical operational experience has been gained under the recommended system."

To promote competition and keep Ecom abreast of the technology, the commission said the Postal Service should offer, on a continuing basis, to interconnect with any communications carrier capable of supporting the service. The post office plans instead to invite bids periodically.

The Postal Rate Commission said this represents a "less comprehensive" form of competition: "The distinction between periodic competitive bidding and continuous free entry is an important one."

These Postal Rate Commission's recommendations now go to the six governors of the Postal Service, who must approve them before they can become final. If the governors reject them, they go back to the commission.

The reconsidered decision can be altered by the governors, but only by a unanimous vote.

The governors' initial consideration is scheduled for Jan. 23.

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## In Response to Adapso Complaint Justice: Bell Software Sales OK Under Decree

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — AT&T's current software marketing activities do not violate the firm's 1956 consent decree, the Justice Department said recently.

The decision came in response to a complaint by the Association of Data Processing Service Organizations (Adapso) that AT&T, contrary to its agreement with the Justice Department not to offer unregulated data processing services, is marketing commercial licenses for about two dozen different software packages.

In an Aug. 20 letter, Adapso asked the Justice Department to invoke the consent decree and force AT&T and its Western Electric Co. subsidiary to stop selling software services and products [CW, Sept. 10].

In a Nov. 21 reply to Adapso Executive Vice-President Jerome Dreyer, Antitrust Division attorney John L. Wilson said his office had looked into the charges and determined AT&T's software offerings do not constitute a "business" to which the decree could be applied.

The Antitrust Division did not turn up any additional information that would alter the findings of an earlier investigation prompted by a Computer & Communications Industry Association complaint similar to Adapso's, according to Wilson.

### Reason for Conclusion

"The 1978 investigation failed to disclose facts which would support an allegation of Judgment [consent decree] violation," Wilson told Dreyer. That conclusion was based, he said, on the fact that AT&T software was developed for internal use, produces minimal revenues and is not backed by support services for external customers.

"The investigation indicated that the programs were developed to meet internal Bell System needs. They do not appear to have been developed to meet a market demand," Wilson wrote. "Buttressing this conclusion is the fact that these programs have been used for a number of years by Bell companies prior to licensing."

"Also, the revenues actually received or projected to be received from licensing are quite small," adding up to approximately \$1.6 million in 1978.

"A second conclusion," Wilson continued, "is that AT&T and Western did not offer 'support services' to licensees. Our experience indicates that

'software houses' and computer manufacturers which license computer programs generally supply considerable 'support' to customers. Western does not."

The Antitrust Division determined that the software offerings are "analogous to the licensing of technology, the sale of surplus property and the sale of property and the sale of products of the reclamation of scrap." They are therefore exempt from consent decree restrictions.

### 'Step in Right Direction'

Wilson went on to say the department will keep a close watch on the situation and take action if it becomes

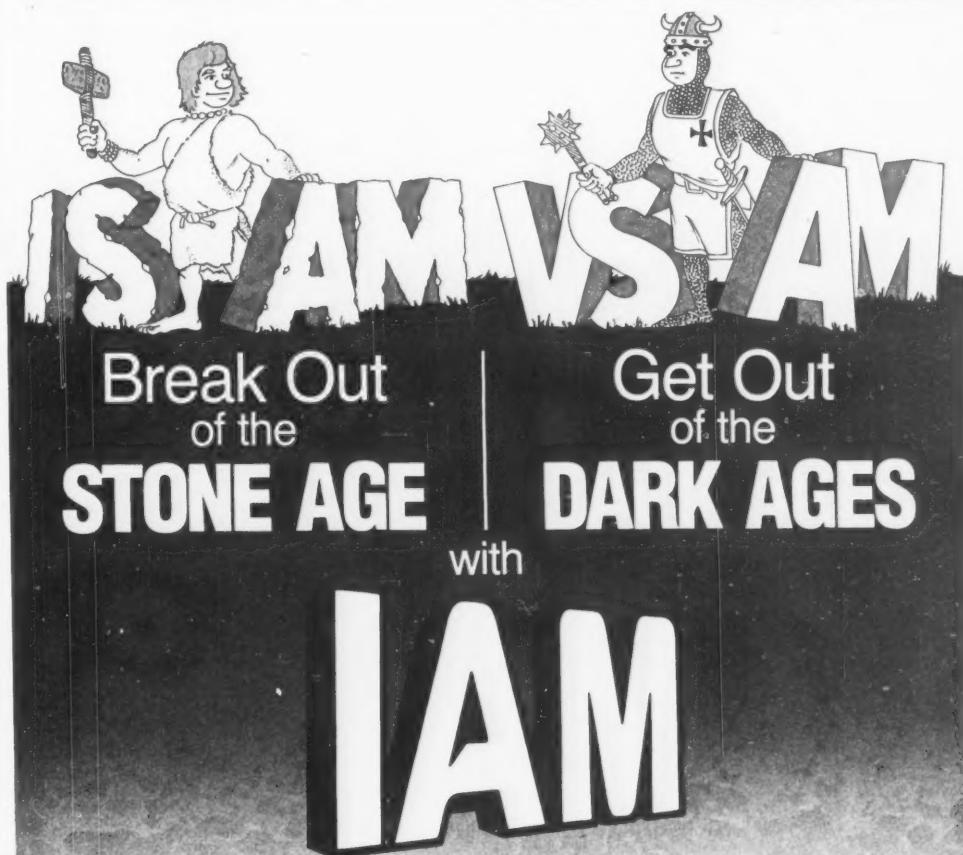
appropriate, a position welcomed by Dreyer. In a statement released last Wednesday, Dreyer said that "although we are not totally satisfied with the Justice Department's ruling, it does represent a step in the right direction."

Specifically, Wilson assured Adapso that "the Department of Justice strongly disagrees with any claim that the Judgment imposes no restrictions on entry by AT&T and Western Electric into the computer programming business. The Judgment would prohibit their offering customized programs or general- or special-purpose programs developed to meet market demand rather than for internal purposes."

Wilson concluded by telling Dreyer that "in the event that there are changes in the character of AT&T computer program licensing activities, the department will certainly reconsider the issues which you raise."

Although buoyed by Wilson's assurances, Adapso said last week it "takes strong exception to the legal bases of the Justice Department's opinion." The association will continue to confer with the Antitrust Division and plans to reply to Wilson's letter early next month.

In the meantime, Adapso and AT&T will continue efforts to establish a joint committee to discuss their differences over Bell System software offerings.



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## National Semi Handling Hitachi

PALO ALTO, Calif. — A division of National Semiconductor Corp. has announced it will take on the marketing of large-scale CPUs made by Hitachi Ltd. of Tokyo.

National Advanced Systems will market the Hitachi equipment, formerly distributed through Intel Corp. National Semi absorbed Intel's faltering computer operation earlier this year.

Details of the National Advanced Systems agreement will be available in January, a spokesman said.



# Testimony Coming From Past Suits Cary Won't Make Personal Appearance at Trial

By Connie Winkler

CW Staff

NEW YORK — The testimony of IBM Chairman Frank T. Cary in the U.S. vs. IBM antitrust trial is going to be a replay of his testimony in the private lawsuits against IBM — he probably will not be taking the stand.

Portions of the transcripts from previous trials will be spread on the record in the case here, and the Department of Justice will counter with portions of the cross-examination from those trials.

This marks the latest attempt to streamline the trial, now in its fifth year. The technique was tried last week with witness Jonathan G. Powers, now vice-president of finance and planning for IBM's Office Products Division. Court met briefly several mornings last week, and the various trial transcripts were presented.

The Cary testimony is expected to be presented between now and the end of the year. The next live witness will not be ready until Jan. 2, the parties told the court last week.

That witness may be either John F. Akers, former president of IBM's Data Processing Division and now group executive in the DP Product Group, or Dr. Sidney Davidson, dean of the graduate school at the University of Chicago and a well-known accountant.

The only possibility that Cary might take the stand depends on IBM head

lawyer Thomas D. Barr's review of portions of Cary's deposition testimony in this trial. The government plans to use portions of the deposition and related documents in its submission.

Barr told the court last week he wants to review those deposition portions and documents before deciding finally about Cary.

Cary's testimony from other trials would come from the Transamerica Computer Co. vs. IBM case, decided this year in favor of IBM, and Memorex Corp. vs. IBM, decided in 1978.

Cary gave 10 days of deposition testimony in U.S. vs. IBM in April and May. In return for his not taking the stand, the Justice Department has agreed to withdraw its subpoena of post-1974 documents in relation to Cary's cross-examination.

IBM strenuously sought to have that subpoena quashed, claiming it would require 62,000 man-years and cost \$5 billion to comply.

## Picking Up Speed

The trial generally seems to be picking up speed. IBM has informed the government it has about a dozen witnesses yet to call, and the last witness was on the stand only three days. The testimony of Samuel R. Sapienza from the Wharton School of Finance is also expected to be stipulated between now and Jan. 1.

IBM also has its president, John R.

Opel, on the witness list, but Barr told the court Opel's testimony might also be replaced by the previous testimony. However, since Opel has not testified in any of the private lawsuits, previous testimony of other IBM executives may be used in lieu of Opel.

## Marshall Dropped

Former IBM general counsel Burke Marshall has been dropped from the witness list. Now a law professor at Yale Law School, Marshall had protested divulging his personal financial information in connection with cross-examination. Judge David N. Edelstein ruled on Dec. 7 Marshall had to turn over the information.

To avoid telling his financial worth, Marshall and present IBM general counsel Nicholas deB. Katzenbach asked Edelstein to quash the request.

"Because of the highly confidential nature of the information the plaintiff seeks, because of the enormous burden of compiling it, because the information is in any event irrelevant to my direct testimony and because the

plaintiff's demand is in my experience unique, I am forced to conclude that I will not produce the information sought," Marshall told the court. "Further, if that is the price to be extracted for my testifying as a witness for IBM, I will not voluntarily appear."

Marshall's planned written direct testimony in the case was attached. It was eight pages long, generally about the structure of IBM's legal department and included such statements as, "IBM's legal staff increased from 70 in 1965 to 100 in 1969."

Marshall was a member of the prestigious Washington law firm of Covington & Burling, and from 1961 to 1965 was Assistant Attorney General for Civil Rights. He was at IBM until 1970, when he returned to Yale, where he had studied.

The Justice Department has sought financial information, including information about IBM stock, from all IBM witnesses to indicate their interest in the outcome of the case.

# Feds to Share DP Expertise With State and Local Sites

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — A program to share federal expertise in data processing with state and local governments has been set up by the National Bureau of Standards (NBS).

The project, under the bureau's Institute for Computer Sciences and Technology (ICST), got under way with the development of a feasibility study to determine what kinds of ICST information can be useful to local DP managers, according to Harlan Smolin, project director.

Smolin is identifying and contacting state and regional organizations of DP managers to explain the program and get their feedback on the usefulness of various ICST standards publications, guidelines and technical reports.

Although there are no plans to expand the program to private industry, Smolin noted that "the information can be used by anyone who has a computer installation" and that anyone can get on the mailing list for ICST information.

formation.

A prime goal of the program, according to NBS, "is to establish information exchanges between ICST and [DP] users/managers." A major task will be to determine how much ICST information, produced for large, federal installations, can be modified for use by smaller governmental bodies, Smolin said.

ICST will not be dealing with individual DP managers, he pointed out, because limited resources dictate working with organizations representing local DP departments. Also, "ICST isn't geared for and can't go out to local governments and give technical assistance in computers."

The program was developed by the U.S. Commerce Department — NBS' parent agency — and the Intergovernmental Sciences, Engineering and Technical Advisory Panel. Organizations interested in the program can obtain more information from Smolin at NBS, Technology B246, Washington, D.C. 20234.

## ANNOUNCING

A unique opportunity for data communications marketers to introduce themselves and their products to key officials in The People's Republic of China.

The People's Republic of China has asked *Computerworld* to sponsor a two-week China Trade Mission, March 13-29, 1980. The topic for the seminar is "Planning and Developing Data Communications Data Base Systems."

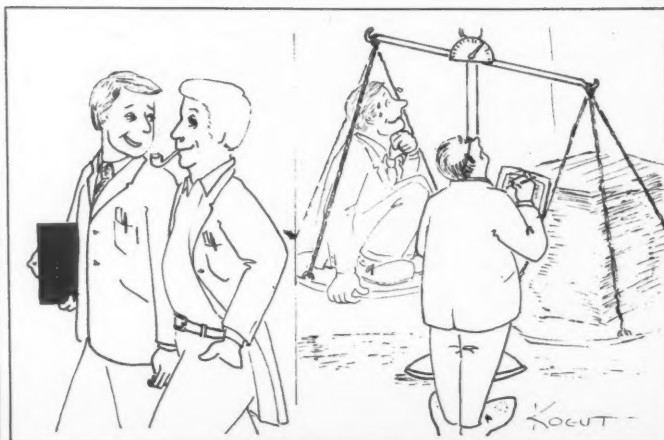
*Computerworld* and the Chinese sponsoring organization, The Chinese Institute of Electronics, are accepting applications from U.S. companies who wish to participate. Representatives of a limited number of American firms will have the opportunity to present technical papers to key decision-making officials in China.

This trip also will give you the opportunity to familiarize yourself with the Chinese computer market and to join other U.S. firms competing in this active, multi-billion dollar marketplace. You will have an opportunity to discover methods of doing business in the People's Republic and to enjoy the unique culture of this "sleeping giant."

Time is short, however, and if you wish to be considered for this trade mission, you must act right now. For further information, please call or write:



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A whole generation of computer buyers has grown up with the computer industry. They know computers aren't magic. They're expensive machines meant to perform specific functions efficiently. What users need is the ongoing dependability to protect their sizeable investments in software and systems.

Rumors regarding new IBM products still create apprehension in the marketplace.

But the truth is, since the 360 computer line, IBM has announced the 370 Series, the 3000 Series, and the 4000 Series, each of which offered upward compatibility from their predecessor. You can bet that IBM won't deviate from this course in the future.

## **So we're in this together.**

Apparently, IBM not only recognizes the compatible mainframes industry as viable, they now realize we're all playing in the same league. The independents are strong and resourceful enough to absorb and satisfy user hardware, firmware and

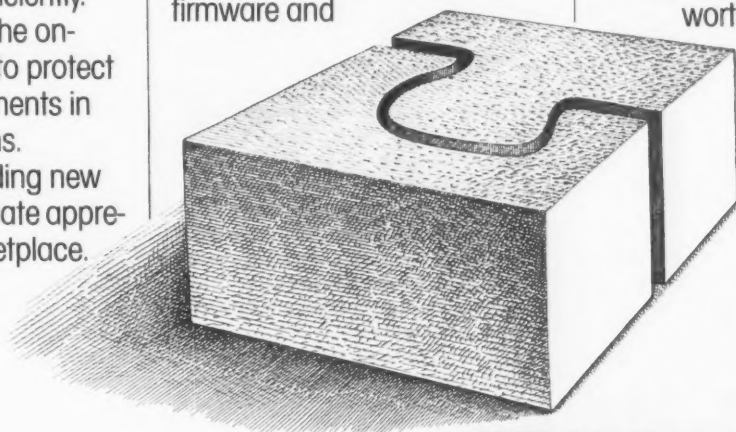
software needs. Compatible computers have come of age. And we've made a firm commitment to that industry with the creation of National Advanced Systems.

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So it looks like IBM will have to stay compatible, or else.

\* Datapro Research Corporation's annual survey/1979



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## EDITORIAL

### Repercussions of 'Stagflation'

The recently released "Weber Survey on Data Processing Positions" from A.S. Hansen, Inc. [CW, Dec. 10] may be useful in assessing how corporate management values DP as the nation enters a period of recession.

Hansen's calculation of a 7.5% average climb in U.S. DP salaries between mid-1978 and mid-1979 is probably less a result of compliance with President Carter's antiinflation efforts, which call for a 7% lid on annual salary boosts, than on the direct consequences of "stagflation."

One sign that this may be so is the disparity in salary movements among different families of DP jobs. Hansen found sub-7% growth for the job areas of applications programming, DP operations, computer operations, telecommunications and documentation. But other job groups gained far more than 7% during the time frame considered.

The job areas of DP auditing, software programming, systems and programming, data entry and data base management experiencing more than 8% annual salary growth. Data base management was well out in front, showing an 11.72% average pay increase.

A poll of DP vendors taken just after Carter announced the 7% lid late last year revealed a number of manufacturers proclaiming support for the measure, but a few other firms expressing vigorous opposition [CW, Nov. 6, 1978]. One well-known vendor chairman, noting that Carter threatened non-compliant companies with loss of federal contracts, maintained he would rather his firm lost all its federal business than lose its most prized employees to rival firms able to offer much higher salaries.

It is not clear to what extent vendors and users quietly refused to apply the Carter plan to their most valued DP employees. At any rate, such dissension may be within the Carter rules if the employer's other personnel experienced slower salary growth, offsetting the gains to DPers and allowing the company to post an overall payroll increase of less than 7%.

Moreover, the President's Council on Wage and Price Stability allows employers to exempt from the 7% ceiling job categories for which labor shortages can be documented. DP professionals are in short supply right now.

Nevertheless, the 7.5% nationwide average for DP salary growth is well below what some observers of the DP job market had predicted. Future DP budget surveys may reveal whether users are now tightening their belts as the nation slides into a recession. Despite the shortage of DP professionals, labor is the fastest growing portion of most users' budgets and may therefore be the place where corporate management will start pruning overhead in DP departments.

If so, there never was a better time for DPers to demonstrate to corporate decision-makers how computing staffs are a powerful means of combatting inflation and improving productivity. Let's not throw out the baby with the bathwater.



## LETTERS

### New Cobol Features

Given the apparent importance of the proposed new Cobol standard, it would be nice if *Computerworld* and/or Alan Taylor would provide us with some examples of the main changes and features of it (some of which Taylor has referred to in two recent columns), ideally in an "In Depth" article, before Taylor discusses it further.

Donald S. Schmick

Atlanta, Ga.

bottom-line watchers?

Finally, the first sale of end-user systems, which address for the most part the general business arena, is already a reality. Would it not be far more desirable to spend our design and coding efforts on interesting applications, rather than master file maintenance?

Relax, Ms. Landon, there is still plenty of work to be done!

Peter J. Tofil

Marlborough, Conn.

### 'Programmerless' Future

I read Michele Landon's article predicting the doomsday for programmers [CW, Dec. 10] and could not believe its content. The majority of programming staffs today are faced with a seemingly insurmountable work load and, therefore, should gladly accept higher level tools to help expedite their tasks.

Although her concern is somewhat valid, it is inevitable that the "programmerless" environment will eventually materialize, at least for the mundane, repetitive business applications.

The escalating software costs, personnel shortages and lengthy implementation schedules warrant that something must be done. The evolution of higher level, end-user-oriented interfaces is certainly a most logical means towards solving these problems.

Generalized tools, such as IBM's DMS interface cited in the article, can reduce the implementation of a CICS application dramatically. I have always been under the impression that computers are supposed to save time and, in turn, save money — I must have been misguided somewhere along the line.

How can this industry — endowed with a reasonable amount of intelligence — develop a "logical child" in the form of a roadblock to progress and not expect repercussions from the

### Ambiguous or Misleading

To anyone unfamiliar with the situation, the "Data Past" item on the 1971 Cincinnati elections must have seemed somewhat ambiguous, [CW, Dec. 3]. To someone who knew the circumstances surrounding that ordeal, it was nothing short of misleading.

The 1971 general election in Hamilton County, Ohio, was conducted on what was known as the Coleman System. This multimillion-dollar election system was purchased by the county in the mid-1960s. The system employed a rather large paper ballot which, when marked with special ink, could be optically scanned and all votes tabulated by computer.

In theory, the Coleman System was a marvel. In practice, however, it fell short. The November 1971 fiasco was a result of these shortcomings.

The last sentence concerning "new criticism" of the "punch-card systems of computerized voting" is either misleading or irrelevant. One might be led by the article to believe that the punch-card system was the system used in the election in question. If this last sentence was not incorporated for the purpose of misguidance, then it certainly seems to be irrelevant.

Hamilton County switched from the Coleman System to a punch-card system in 1974 and has used this same system with great success ever since.

J. Hoyt Prisock

Westchester, Ohio

## DATA PAST

### Five Years Ago

Dec. 25, 1974/Jan. 1, 1975

WASHINGTON, D.C. — The Federal Communications Commission's "conditional approval" of AT&T's Dataphone Digital Service in 24 cities meant that customers in 19 of the 24 cities would have to pay as much as 50% more for the same service.

### Eight Years Ago

Dec. 21, 1971

NEW YORK — A Frost & Sullivan, Inc. study predicted that in the 1970s computers would drop radically in price while both memory sizes and speed increased, but software costs would continue to rise.

WASHINGTON, D.C. — The Independent Data Communications Manufacturers Association charged that AT&T's Data Access Arrangement "discriminated against customers providing their own modems and other [non-carrier] equipment."

WASHINGTON, D.C. — A compromise law to guarantee the privacy of personal records kept in government data banks passed both houses of Congress and was expected to be signed by the President before Christmas.



## HUMAN CONNECTION/Jack Stone

## Electronic Cheer

News item: The following headline, reprinted in its entirety, appeared as the lead for a three-quarter-page advertisement in the *Washington Post* last week, touting the wares of an electronic specialty store:

"COMPUTERIZE CHRISTMAS!"

\*\*\*

News item: My little brother, a full professor of computer science, telephoned me a few days ago when he was in town. He's married to a systems programmer/mathematician/computer research scientist/poet. They have a nine-year-old son.

To avoid embarrassing him, I withheld critical questioning of a rather tense family situation until we had exchanged greetings. Then I unloaded.

"Tell me. Have you resolved — the problem?"

"Not really, no," he answered, rather painfully. "Frankly, I've tried everything I could think of — counselors, ombudsmen, lawyers. I've even invoked the doctrine of basic fairness — but I've made little headway. My son demands first priority access to our personal computer from the time he comes home from school until he goes to bed, and he won't settle for any-

thing less.

"My wife and I are doing some critical operating systems research, and we still aren't getting enough second-shift machine time to meet our schedule."

\*\*\*

The time: Winter, 1984

The setting: Shopping Mall, U.S.A.

The situation: Harold and Jan (family ID 3f889991) are out Christmas shopping with their young son, Jeremy, a fourth grader. They are middle-class Americans — just plain folk. The scene opens with them holding hands, window-shopping just outside the local computer retail store.

"Daddy, daddy! Look here! The new Hyperbasic interpreter has been released. Can we get it for our machine? Please? Please? I'll promise to give up one of my scratch microdisks."

"Jeremy, if I told you once, I've told you a hundred times: Hyperbasic does not meet our needs. The definition statements are too cumbersome and slow down program execution time. Numerical calculations are only accurate to 24 significant digits.

Besides, the vendor promised to come up with SEEK and STROKE statements to replace the obsolete PEEK

and POKE for this language system, and I don't see them in the list of language statements."

Jan tried to intercede. "Now, Harold, you shouldn't be too harsh on the child. After all, he is not totally familiar with all the language facilities and services and, like most his age, he tends to overlook the deficiencies in software products."

"Mommy, can I at least get the Model 14 voice recognition device? You can program it for 30,000 words. Georgie's got one and it's really neat. Right now, we're limited to 10,000."

"No, dear, I don't think so, not this year. As you know, we really haven't fully utilized what's currently installed. Anyway, the technology is changing so fast that the industry will probably bring out a 100,000-word device in not too long a time for about the same price."

"Oh, Daddy, look! Look at this printer!" Jeremy began reading from the placard giving the specifications.

"Print density: continuously variable from 5- to 20 char./in. Print width: up to 20 in. Print speed: 600- to 1,000 char./sec." Boy, this could really speed things up when I compile my Global programs."

"Bah, humbug. I have no interest in expanding our machine support of Global. That language can't touch Master-Terse. It may be easier to learn and to use, but it is not nearly as elegant."

Again, Jan tried to smooth things over. "But, dear, we could also use the new printer to handle our SYSOUT queue. I think we could save a lot of time. Besides, its color would complement the accent panels on our mainframe very nicely."

"Lookie, lookie! They've released a new software package called 'Fifth-grade.' It has all the quizzes and tests for all the courses that I'll be taking next year, and it's written on a totally interactive, parameter-controlled, menu-driven basis. This could really help my course work. How about it, Dad?"

"No way, Jeremy. Until we can afford a second terminal, I do not want to allocate so much machine resource to your cogitating on-line ... Hey, what's this? A communications adapter which can carry a 10M-byte signal to a satellite. We can transmit wideband around the world! I've just discovered the perfect Christmas gift for the family!"

## THE TAYLOR REPORT/Alan Taylor

## Compiler-Writer Version Could 'Liberate' Cobol

Use of a special division of Cobol for compiler writers only could provide an effective and economical way around the multimillion-dollar conversion problems currently being forced on Cobol users. At the same time, by permitting the emergence of a new type of Cobol compiler, liberated from the ownership of the hardware vendors, the language would be kept uncluttered so that application maintenance would be minimized.

In short, Cobol in all its forms — application programs, standards changes and compilers — would become much more hardware independent and much more transportable.

This is the unavoidable conclusion of an investigation I have performed after receiving the following letter:

Dear Alan:

I am writing in response to the Dec. 3 Taylor Report. Having written a Cobol compiler in Cobol, I find the addition of Boolean variables to the Cobol language would be of aid during actual code generation and storage initialization.

Because these portions of the compiler are likely to change between systems of different machine architectures, a careful compiler designer would place those sections into the compiler so that they could be modified. Having these sections in clearly written Cobol enhances the maintenance.

The addition of Boolean variables is of little aid during the remainder of the compilation process (parsing, address

resolving, error handling or control). Cobol performs these other areas very well, and because I wrote the compiler without using Boolean variables (it's written in 1974 Ansi) I obviously didn't find it unacceptable for code generation or storage initialization.

The second point I wish to comment on is that I agree a more orderly development of Cobol is required. I believe Cobol survives as a language because it is a straightforward method for the business community to engage ordinary programmers in keeping systems operational.

The more cluttered the language becomes, the less likely a program written in it will be understood by a programmer encountering it for the first time to fix or enhance it. This creates fewer opportunities for programmers of ordinary ability and creates a disturbing dependence on fewer and fewer people to support the data processing community.

Keep the faith,  
Robert T. Lindsay Jr.  
Delray Beach, Fla.

The letter itself does not say anything about a Cobol Compiler-Oriented Language (Cocol). However, it does say that in most of the parsing, table preparation and analysis in a Cobol compiler, Cobol itself in its current form is adequate. Lindsay also says that with Boolean as an additional facility, such compilers can be economically moved from one machine architecture to a new machine architecture.

(Continued on Page 16)

## READER COMMENTARY

Jay Becker

## DP Crime Center Handles Harassment

Shortly after *Computerworld* carried a Taylor Report entitled "DP Crime Center Should Handle Harassment, Too" [CW, Oct. 15], the National Center for Computer Crime Data received its first call ever about harassment.

"Did you see what that x\*#! Alan Taylor said about your center?" a concerned caller asked. And for just a brief moment I felt harassed.

The moment was brief because actually it was rather hard to tell. Taylor's column seemed to be harassment. It was rather dramatic in its leaps of logic, drastic in its pronouncements and slipshod in its presentation of facts.

Consequently, it was rather difficult to be sure whether the article was based on the fact that Taylor had anything to say about the National Center for Computer Crime Data itself or whether he just wanted to piggyback an old gripe of his on top of the fact that he had paid our data center a visit.

Taylor's connection between the center and the fact that the Los Angeles County District Attorney's Office has been dunning a poor citizen for an enormous child support bill that he never should have had to pay reminded me of a speech I heard once in college. A classmate of mine spoke for 10 minutes about *Playboy* magazine and photosynthesis. He'd give us a paragraph or so about *Playboy* and then switch to a paragraph or two about photosynthesis, back to *Playboy* and then back to photosynthesis.

At the end of his allotted 10 minutes, the method to his madness became

clear "and thus, in conclusion," he smiled broadly, "we can conclude that a good speech should be about one topic and not two."

That is a lesson I think Taylor would have done well to learn. In the course of arguing the importance of serious attention to the problem of computer error, he made several errors of his own.

Since these errors relate to a project that has been near and dear to my heart for the last two years, I feel impelled to respond to some of the major points he has raised.

1. The center's title reflects neither national demand nor national support.

In a sense, Taylor was right. The demand and the support is really not national — it is international. In the last two years, the center has answered inquiries, provided speakers and documents and developed working relationships with interested individuals and groups in England, Norway, Germany, Israel, Switzerland, Italy and South Africa.

Center personnel have lectured on the problems of computer crime for groups in Minnesota, Washington state, Texas, Kansas, Arizona, Bermuda and England. We have worked with the Federal Bureau of Investigation, the American Society for Industrial Security, the National District Attorneys Association and the Association for Systems Management. Legislators from the U.S. Senate, California, Illinois and Wisconsin have called, asking our help or input and availing themselves of our data base of com-

(Continued on Page 18)

## Shortsighted View

Arthur G. Rauch's view expressed in his letter in the Nov. 26 issue was shortsighted. He suggested that analyst/programmers seek employment with companies that don't offer pension plans so they can have their own Individual Retirement Accounts.

While the lack of portability of pension funds is a severe problem in an industry whose employees are as mobile as we are, the cause of the problem lies not with the companies or their pension plans, but with the federal tax structure. Congressman James Corman of California has introduced a bill (H.R. 628) that would allow the establishment of an IRA in addition to a company pension plan. This bill is now pending before the House Ways and Means Committee (chaired by Rep. Al Ullman [D-Ore.]).

Those who share Rauch's concern over providing for retirement should write their congressmen and Rep. Ullman in support of H.R. 628.

Bob Brown

Atlanta, Ga.

## Pension Reform

The Arthur G. Rauch Jr. letter [CW, Nov. 26] raised the important issue of pension portability. Under present conditions, the company-paid pension "benefit" is in reality a form of enslavement that is wholly out of sync with the times.

That pension reform is long overdue is manifested in the ground swells to be seen in numerous professional societies. Constituencies are increasingly pressuring society leadership to mount substantive campaigns toward pension independence. As a member of the Institute of Electrical and Electronics Engineers I am aware of such a drive in behalf of this society's professionals.

St. Augustine said of Hippo, "Where there is love, there is no labor. But if there should be labor, labor itself will be loved." The latter sentence has relevance to professionals who derive a personal satisfaction and fulfillment from their work — engineers and DP professionals are said to be so smitten. This romantic relationship continues until one smells a rip-off. The present state of pensions is clearly in

# LETTERS

this category.

To run from the problem as Rauch suggests, by ignoring companies with retirement plans, is no solution at all. Far better is the establishment of a "No, thank you" approach to pensions, where a choice is had in either accepting the company plan or being able to say "No, thank you" by opting for an IRA. This can only come through a concerted

campaign directed at Capitol Hill. Until this happens, our professionalism will continue to ring hollow.

Peter Kushkowski  
Haddam, Conn.

## Comments Appreciated

Kevin Davidson's letter in the Dec. 10 issue in response to my Reader Commentary article [CW, Nov. 26] is greatly

appreciated. I fully agree with the improvement suggested and the arguments supporting it. Good models yield great improvements.

On the other hand, Allen Savin's remarks hardly deserve comment. I'm sorry to say that the world will always suffer this type of "argumentum ad hominem."

Anthony F. Vignone  
Vernon, Conn.

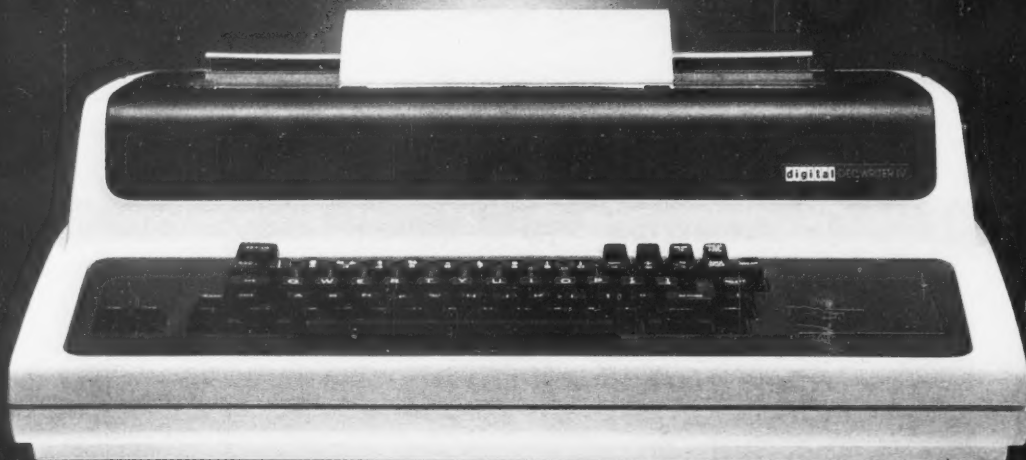
## Suggestion for DPMA

The Data Processing Management Association could remove sexism from its Computer Science Man of the Year award simply by renaming it the Computer Scientist of the Year award.

J.H. Tarrant  
Greenville, S.C.

Computerworld welcomes comments from its readers. Letters should be addressed to Editor, Computerworld, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

## DECwriter IV. The leader in terminal printers does it again.



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## Design Is the Thing

I have maintained, in recent years, that structured programming is on fairly solid ground and taken for granted. To my total amazement, the topic is now up for debate and conjecture abounds.

In classes I have taught on "structured," I reported a history of evolution and change beginning with structured coding standards and evolving into structured methodologies as follows. From the guidelines set forth in the Dijkstra era, it was clear that some de-

signs could not be done in a structured manner without changing the design itself. This forced a rethinking of the design process and led to a set of methodologies for designing a "structured" system. This in turn forced more thought and work into the analysis phase of systems development.

For these reasons, the label "structured programming" sort of carried over to refer-

ence the entire "structured" development process. I interpret this to say that you cannot have structured programming without structured design and you cannot do that without a methodology in the analysis phase to provide the proper information. In other words, the design is the thing, not the coding standards.

The recent argument in *Computerworld* surrounding the use of GOTOs is almost

insignificant to the "structured" technology. I applaud Anthony Vignone's article "GOTO 'Outbursts' Ignore Central Design Issue" [CW, Nov. 26] and am totally repulsed by the now infamous Lim-Sherman debates. I insist that if the design is structured and correctly so, the resultant code must at least contain the characteristics of "good structured code."

I have seen such code done

with GOTOs, though it takes a rare talent to do so properly and prefer that no GOTOs are used at all.

John A. Moccabee  
Marion, Ohio

## Beware of Nesting Pit

In his Nov. 5 commentary, Bruce Sherman made some good points, but he was far from convincing me that any of Pacifico Lim's code [CW, Oct. 1] is illogical, hard to understand or even mediocre.

Since Lim's code was on the left, I read his first and had no more trouble comprehending it than I did Sherman's. I found Lim's end-of-file processing to be perfectly clear and I much prefer his GOTOs to the hard-to-trace nested performs that a GOTOless program requires. The latter method also gives rise to deeply nested IFs, which I also dislike.

It is much more satisfying for me to see the reformat routine of Figure 3 as an entire block that begins at the top and exists at the end with all the processing inside than to have a "main" sequence that was PERFORMED elsewhere and that PERFORMS another paragraph that PERFORMS another paragraph, ad infinitum.

This is again the hard-to-trace nested PERFORMS. Of course, in these small pieces of code, the logic is obvious. It is in longer routines that nesting can become intolerable.

Last, Sherman found Lim's code cumbersome in Figure 6. I agree, but Sherman's version does not solve the problem unless the fields are the same type and length and unless the edit criteria are identical for every field.

The GOTOs do not compromise the readability of a program, and in some cases, they may enhance it.

Certainly they must be used with care in a structured environment, but there lies a point beyond which one falls into a nesting pit from which the return can be extremely hazardous.

Susan M. Glasner  
Seaside, Calif.

## LETTERS

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## User Participation

Edward Yourdon's article in the In Depth section titled "Structured Life Cycle" well presented both a synopsis of differences between old approaches and the structured approach and in-project management of the options in applying structured methodology [CW, Dec. 3].

There are at least two additions that I would use in the data flow diagram in Figure 4 on page ID/5. These additions are two lines originating at the "users" box and each flowing respectively to the activity circles — "Acceptance Test Generation" (circle 5) and "Quality Assurance" (circle 6).

Granted the user may not be able to comprehend or even need to be involved in all aspects of these activities, but there are areas in which participation is vital and meets with the ideas presented in this article.

In my opinion, this article, like many others, overlooked the importance of user participation in the development and acceptance of the design of the work flow environment. This includes screen and report designs, forms, general floor-plan schematics, anticipated personnel efforts and simulation of system for testing flow and information requirements. This should all be done prior to program design.

Perhaps this area is considered to be outside the realm of a DP project.

However, too many systems have failed or have performed badly until the work flow was properly designed.

Yourdon partially addressed this area in the "Analysis" activity 2 where he limited this to the "logical" level only, which is a far cry from the level of understanding which the user should have attained at this time in the project.

Assisting the user to develop at least a basic work flow design environment (I prefer to call this "External Design") prior to the computer module designs will provide several benefits, one of which allows the user to be involved in activities 5 and 6.

Another important benefit is to force the user and analyst to perform a basic role play and simulation of the expected system. This provides for the user and analyst to test conceptual theories prior to the starting of computer module design and subsequent development.

Another benefit is that this alone will reduce the number of changes generally required at a later date. Still another benefit not to be overlooked is the possibility of starting on the development of a "new office" procedural manual, which of course must await finalization until after the computer interface operational procedures are available.

Ralph L. Jull

Salem, Ore.

## Question of Readability

We were pleased to read Michael Dickenson's commentary which contained a number of suggestions for improving Fortran IV ["Structured Techniques Ease Fortran Readability," CW, Nov. 5]. While we applaud his emphasis on readability, his commentary raises several questions: Do all of his suggestions really help? Does the ef-

fectiveness of these techniques depend on such factors as the experience of the programmer or the size and complexity of the program?

Programming is clearly a complex activity requiring a broad range of skills and abilities. Common sense, intuition and personal experience are valuable in suggesting ways to improve readability, but only through controlled experiments can we isolate and evaluate the effectiveness of these techniques. Although the experimental evaluation of programming techniques is still in its infancy, we are beginning to understand the factors leading to increased readability.

Several of our experiments at General Electric Co. in Arlington, Va., have shown that in modular-sized programs, a structured control flow was more readable than a convoluted, spaghetti-like flow. At the same time, the use of comments and mnemonic variable names did not enhance readability. So it appears that at the modular level, a straightforward, beginning-to-end control flow has a greater effect on readability than comments or mnemonic variable names. It remains to be seen whether this holds true at the systems level.

The implication of these findings is that the structure of the control flow is a powerful factor in determining readability and programmers would be wise to invest their efforts in writing structured code.

There are numerous experiments waiting to be performed on the techniques suggested by Dickenson and by others for improving readability. As the costs of software development and maintenance continue to increase, experimental evaluation should be given a greater role in selecting software tools and providing programming standards.

Elizabeth Kruesi

## 'Cocol' Can Give Liberated Cobols

(Continued from Page 11)

Lindsay does not say that ordinary business-applications writing in Cobol should incorporate Boolean. In fact, in commenting about the effects of adding new facilities such as Boolean to the application area of Cobol, the author clearly stated that Cobol's usefulness is dependent upon keeping the language very straightforward and maintainable by ordinary programmers. The clear implication, then, is that Boolean should not be included in application programs, but should be included in Cobol somewhere — so I suggest including it in a special compiler-writers area, Cocol.

### Economics Key

I take this letter very seriously because the author has done what few thought possible economically. In a one-man firm, he produced his own Cobol compiler, in Cobol, and sold it to IBM.

IBM in turn markets the compiler for the Series/1. The Lindsay Cobol was delivered before another, IBM-created, Cobol was available, and while I don't know any financial details of the two Cobols, I can guesstimate the Lindsay costs at no more than \$200,000. That is not much as software development

costs go.

With this type of background, it is worth looking further into Lindsay's points and trying to envisage just what would happen if enterprises like Lindsay's Advanced Software Products had the facilities to offer Cobols on the open market.

### How It Could Work

A hardware manufacturer could offer a minimum, Basic Cobol/Cocol system, along with the hardware. The independent Cobol vendors would offer Cobols of various types then — or perhaps plain vanilla ones.

An installation purchasing such a Cobol would have the right and ability to transfer the compiler itself to a new machine architecture so that at the user-application level, the programs and the compiler would remain constant.

And Cobol would at last have achieved the transportability that has been its goal for decades.

The hardware vendors could also, if they chose, offer bigger Cobol systems just as they do now. Many people would choose these, doubtless. But the availability of competitive independent Cobols would probably have its impact even here.

Sylvia Sheppard

Bill Curtis

Software Management Research  
Information Systems Programs  
General Electric Co.  
Arlington, Va.

## Sex Discrimination

It's no wonder that well-qualified women still have a difficult time earning respect in the computer field, as well as in other areas of our society!

In "Series/1 Drives Business Operations," you favorably review our Distributor System 1.0 [CW, Dec. 3]. You repeatedly refer to the *spokesman* for The Systems Guild, Inc., and you further refer to that spokesperson as *he*.

I am that spokesperson. I wrote the press release, and I also wrote the cover letter which accompanied the press release and which was signed with my name (obviously feminine). I know that this incident is not a case of being subject to the limitations of the English language, in a situation where the antecedent to a noun or a pronoun is unknown.

I suspect that I have inadvertently been discriminated against, because it was not important to *Computerworld* personnel to emphasize that the spokesperson for The Systems Guild, Inc. was, indeed, a spokeswoman.

Unfortunately, in this case, such lack of attention to detail has the effect of serving to propagate the myth that executive positions are, and by implication should be, filled by male personnel. And so, I regret that this error was made.

Diane R. Altman

Vice-President

The Systems Guild, Inc.  
Briarcliff Manor, N.Y.

The erroneous reference was indeed unintentional. The cover letter was missing when the press release was received. Our apologies. Ed.

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## Better Writing

I've been following the "Writing Tips" articles in *Computerworld* with great interest, as we all need improvements in this area. A remedy suggested in your "Yes, We Have No Bananas" article caught my eye. While I do not profess to be an expert, the opportunity to attack three "ofs" in one sentence was more than I could resist.

**Example 5: Anti-Salt II Treaty** advocates have been accused of exaggerating the weaknesses of the treaty.

**Your remedy:** Opponents of the Salt II Treaty have been accused of exaggerating the weaknesses of the treaty.

**My suggestion:** Salt II Treaty opponents have been accused of exaggerating the treaty's weaknesses.

I have thoroughly enjoyed the series and applaud CW's decision to address this important subject. Keep up the good work.

Theodore J. Tofil

Hartford, Conn.

## Power Problems

"Power, Maintenance Problems Constant in Boonies" [CW, Oct. 15] offered a good illustration of how line power problems are often confused with computer malfunctions, resulting in faulty diagnoses and migraine headaches.

Crashed disk heads, data loss and intermittent run times are enough to make any DP manager throw his hands up in disgust. But while hardware and software consultants often point their fingers at one another and the user blames both, the real culprit may be the ac power line.

The operating difficulties displayed by the farm coop's system hardware were recognized as being caused by the external power line, yet the DP manager expected IBM to "fix" his machine. His software difficulties may also be the result of a "dirty" power line, since voltage transients and electrical noise can easily cause all of the malfunctions cited.

Nowhere in the article, however, was mention made of voltage regulation as a possible solution. Although such power line problems are often worse in the boonies, they are a fact of life across the country, especially in industrialized areas. With the variety of power protection equipment available today for all types and sizes of computer systems, it is surprising the IBM site engineer made no recommendations in this area.

Electronic line voltage regulators, in power ratings to 500 KVA, offer full protection from spikes, noise and longer term voltage dips and surges.



'He Asked the Computer for a Solution to the Gas Problem.'

# LETTERS

Units specially designed for mainframe computer use are available to attenuate both transverse and common mode noise, while adjusting output voltage continuously and steplessly to  $\pm 3\%$  of nominal.

For minis and microcomputers, constant voltage transformers, specially modified to achieve high noise attenuation, perform a similar function. In severe brownout conditions, when line voltage may drop as low as 60% of nominal, voltage regulation units will maintain output power within Nema specifications of  $\pm 5$  to  $-10\%$  of nominal.

Uninterruptible power sources (UPS) offer the ultimate in power protection, providing a "clean" power feed to the

computer system even during blackouts. These units are equipped with battery banks to continuously power the load during a power outage, with full transient suppression and noise attenuation.

While power outages may be more frequent in rural areas, noise and voltage fluctuations are just as common, if not more so, in an urban development. It is startling that none of the site representatives investigated this possibility. When it comes to line voltage irregularities and their prevention, the "boonies" are a state of mind.

David Kemp  
Electronic Marketing Manager  
Sola Electric  
Elk Grove Village, Ill.

## Improving Fortran

I have read Walter B. Novinger's commentary on Flecs [CW, Sept. 17]. It pleases me very much to realize that, in spite of all rumors, Fortran is still alive and kicking.

What pleased me even more is the fact that other people beside myself (people like Terry Beyer) are trying to improve Fortran. Beyer's Flecs is very much similar to my Structure-Oriented Fortran (SOF), which I wrote in 1975. SOF, like Flecs, is a preprocessor written in Fortran. It supports structures like WHEN — ELSE.

Unlike Flecs, SOF requires between one-third and one-half of the compiler CPU.

SOF has virtually replaced Fortran in our department and is used with IBM and Control Data Corp. equipment.

Nahum Ben-Porath  
Jerusalem, Israel

# Software a hardship? Let someone else do it.

As applications software packages become increasingly diverse and flexible, user demand for them continues to rise. By 1981, says International Data Corporation, packaged software will account for more than half of software industry revenues.

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- Software evaluation—choosing the right packages for the right system.
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If you're an MIS Executive, DP Manager, Supervisor or Lead Programmer, you'll want to read our January 28th Special Report. And if you market programming products or services, your ad should be there. Ad closing date is January 11th, and your *Computerworld* representative can give you all the details. Or, to reserve space for your ad, call Frank Collins at (617) 879-0700.



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# DP Crime Center Deals With Harrassment

(Continued from Page 11)

puter crime legislation as well as the analytical studies we have undertaken as to the merits of various pieces of computer crime law. We have fielded questions from law enforcement authorities in Minnesota, Arizona, Florida, Utah and New York.

Thus I would question the sampling technique by which Taylor concluded there is neither national demand nor national support for what we do. He visited with me for perhaps five hours one day, and I guess no one called with a computer crime problem during those five hours.

Frankly, I'm glad. If every five hours the center received one call, there would be little time left to do the other things the center has always done, like

collect and disseminate information about computer crime.

2. "The danger of the computer lies mainly in the ability of its operators and users . . . to evade accountability for repeated errors in output."

I've always distrusted arguments that are formatted along the line "x isn't the problem, y is." At best they are forwarded by people so consumed with the importance of "y" that the importance of "x" escapes them.

Unfortunately, it is often the case that people would prefer to get others away from working on "x" to actually working on "y" themselves.

To say that the main danger of the computer revolves around accountability is to ignore such trifling concerns as the inadequacy of many pre-

cybernetic era laws to deal with computer crime, the resistance of the business community to reporting computer crime and the mythology about computers which hinders computer crime fighting. There are so many computer crimes facilitated by things totally removed from the lack of accountability of computer operators and computer users.

Would Taylor really be happier if our data center spent none of its time considering these problems and spent all of its time addressing his concerns instead?

3. "The National Center for Computer Crime is run by Los Angeles' district attorney, John K. Van Der Kamp."

Just to keep things straight, it is

called the National Center for Computer Crime Data and it is run by myself — Jay Becker — not John K. Van Der Kamp. I should have thought that Taylor would remember that the center is a private endeavor earnestly seeking government or corporate support, since he commented jocularly about the line on our all-purpose response form saying, "Your offer of \$10 million for the continued operation of the National Center for Computer Crime Data is gratefully accepted."

Even in these days of Proposition 13 austerity, the District Attorney's Office isn't making appeals like that. This leads inevitably to points 4 and 5 in our response.

4. "With a little imagination, another filing cabinet and slight change of purpose and title, the center could be a real and valuable fighter of computer crime."

We don't put a high priority on another filing cabinet, from John Van De Kamp or anyone else. We need money and personnel to gather the documentation of computer crime and to index it so that when an investigator or prosecutor faces his first computer crime case, he need not reinvent the wheel. We need resources so that we can do the research on the implications of international computer crime that no one else seems to be doing at present.

We need the support of the business community so that we can get together with businesspeople and begin to talk about the reasons they don't report computer crime and find out what we have to do to convince them it is in their interest to report more of these crimes.

If there's one thing I doubt that I lack, it's imagination, but all the imagination in the world can't replace the money and personnel necessary to reach the goals one's imagination suggests.

5. "It is . . . a pity that the crime center is so limited in scope."

Limited in scope are we? Unresponsive to problems presented by computer errors of the sort Alan Taylor bewails?

Let's set the record straight. We are extremely interested in the problem of errors in computerized output. We have had an ongoing concern with what we call consumer protection issues in computer crime and thus have sought out accounts of errors, error detection mechanisms and quality control solutions which are in effect.

One of the ways that we have attempted to gain information about the consumer protection problems of computer crime is by asking an expert to address this very topic for an article in the *Computer/Law Journal* special issue on computer crime. We came up with someone who has written on the topic extensively, one whose credentials I was sure would impress Taylor: We asked Alan Taylor to write that article for us. (He even accepted, and I hope this response will not cause him to change his mind.)

Taylor's concern for the consumer who is the unfortunate victim of computer crime error is one we share completely. Alan, we'll be delighted to help you try to bring about a change in that area of the computer industry, so why don't you let us roll along fighting crime as well?

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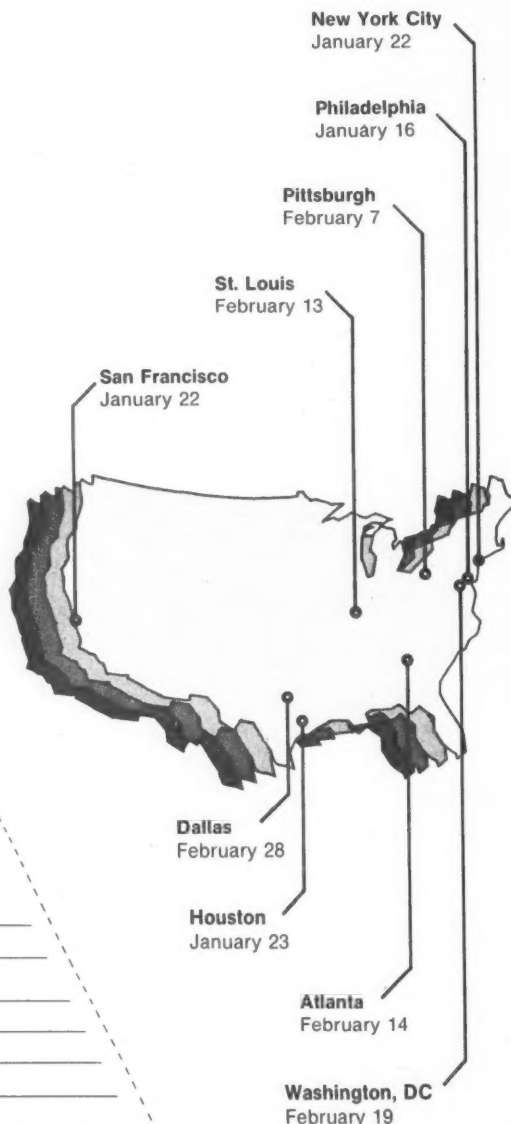
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C5



## 'Faver' Runs Under OS/VS

COLUMBUS, Ohio — Previously available only for IBM DOS/VS sites, the Fast Virtual Export Restore (Faver) dump/restore utility has now been released by Goal Systems Corp. for OS/VS installations with Vsam files.

Faver allows clusters or groups of records to be dumped from ("exported") or restored to disk individually or by catalog or volume. Control cards are required for operation and virtually no JCL is needed, a spokesman said.

Benchmarks have shown Faver's "export" time to be up to four times that of IBM's Idcams, he added.

The Dump/program maintains pertinent catalog information on the backup tape, allowing the restore to be totally automatic. Faver handles all delete/define operations. Vsam structure testing is incorporated to identify damaged clusters.

A Compare feature checks for a readable tape and an accurate backup by performing a byte-for-byte comparison of the tape and the clusters just "exported", the spokesman noted.

Clusters which have been allocated and opened by an on-line system such as IBM's CICS may be exported while open if update activity is stopped, he added.

The restore optionally allows automatic cluster definition to be bypassed and will use a previously defined or reusable cluster. During the restore, a user exit can be included to direct Faver to delete, modify or insert records.

Faver reportedly supports all cluster types and organizations. Export tapes are device-, catalog- and operating system-independent.

OS/VS Faver is available for \$2,500. Monthly and yearly leases are available. Goal Systems can be reached through P.O. Box 29481, Columbus, Ohio 43229.

## 'Dumper' Backs PDP-11 Users

NEW YORK — Enterprise Technology Corp., has released RSTS/E Dumper, a high-speed disk contents backup/restore system for use with the RSTS/E operating system on Digital Equipment Corp. PDP-11 series computers.

The package enables users to transfer individual files, whole user accounts or entire disks or multiple-disk structures to and from magnetic tape, supporting all disk and magnetic tape devices currently supported by RSTS/E except floppy disks and Dec-tape, according to a spokesman.

Transfers are initiated through a short dialogue which can be saved in a command file to simplify subsequent operations. Dumper transfers files to tape approximately 35% faster than DEC's Backup package and in-

## Two Centers Added 'Edpep' Training Expands

WELLESLEY, Mass. — The EDP Education Program (Edpep), started at Babson College here in 1974 and expanded to two other areas since then, will be further extended — to North Carolina State University and to Indiana/Purdue Universities — shortly after the first of the year.

Organized by QED Information Sciences, Inc., Edpep supplements a member company's own training efforts and allows a company to plan, budget, schedule and control expenditures related to DP training.

Under the Edpep plan, a series of courses covering both managerial and technical topics are offered at facilities provided by the host educational institution; instructors are supplied by QED. A company can become an Edpep member by buying one or more seats for the various courses.

Although the courses are now open to any interested company on a space available basis, membership entitles companies to participation in an Advisory Council that tailors the curriculum to the needs of the members in its region and monitors the effectiveness of the course presentations.

While the core curriculum forms the backbone of Edpep, satellite courses have been offered to provide instruction in subjects not covered by the original plan.

Between its start at Babson and its current expansion into North Carolina and Indiana, Edpep has been implemented at Fairleigh Dickinson University in New Jersey and at Drexel University in Philadelphia.

Companies that are members in one region now can send employees to courses in any region. Under this "network" arrangement, a member company can participate in courses in any region for \$90/day per student and nonmember companies can participate equally widely for a fee.

Recognizing that some companies are so dispersed that they may not wish to be tied to a particular region as a home base, the program also provides associate memberships under which a company can buy blocks of 30 days of training for \$115 each and use them in any region.

More than 2,000 students are involved in courses each year, QED said from 141 Linden St., Wellesley, Mass. 02181.

## Independent's Package Eases CRT Screen Work on HP 300s

CLEVELAND, Ohio — Now being offered by ISM Corp., an I/O-handling utility and a pair of optional extensions to it are said to simplify use of the Hewlett-Packard Co. 300 CPU and 2621 and 2640 terminal systems.

ISM's Starform package is basically a forms-designing utility that relieves development programmers of the need to format

I/O statements for the HP 300. It supports the HP 2621 as well as the 2640 line of intelligent terminals and their associated display and unprotected features.

Starform output is supported on HP 2608A and 2631A printers. A series of system calls allows programs to transfer data between peripherals and selected fields designed in the forms programs, a spokesman said. Starform costs \$5,000.

ISM's Detached Job Monitor (DJM) and Spooler/Scheduler (S/S) are system utilities that work in conjunction with Starform. With the DJM, queues are initiated as needed through calls, and jobs are scheduled on a priority basis. This utility also maintains information about data resources if recovery is needed, the spokesman added.

S/S interfaces with Starform and DJM to maintain appropriate queues feeding into HP 2608 and 2631A printers. The queuing itself can be ordered by the type of paper to be used or other user-defined considerations.

This utility can spool entire files to the printer and schedule tasks to print. Queue lengths are limited only by the size of the system disk, the spokesman said.

Priced with Starform, the two utilities cost \$7,500, he added from ISM at 11000 Cedar Ave., Cleveland, Ohio 44106.

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## Package Cuts Cobol Coding by 70%

VAN NUYS, Calif. — Still another Cobol source code generator is now available for IBM-oriented data centers. Autocobol from Occidental Computer Systems, Inc. produces full Cobol code and standard JCL from simple control cards and shorthand notation, a spokesman said.

With this generator, the user can not only abbreviate file names, data elements, paragraph names and procedure

verbs, but entire Procedure Division statements as well, he noted. A single job control card triggers all required JCL and the Identification Division in its entirety, he added.

The Autocobol precompiler takes user-supplied parameters, normal Cobol source statements and abbreviated statements and generates an input stream to source libraries controlled by Pansophic Systems, Inc.'s Panvalet or

Applied Data Research, Inc.'s The Librarian. The input stream may also be passed directly to the Cobol compiler depending on the user's specifications, the spokesman continued.

Autocobol was designed to eliminate 70% to 75% of the routine coding required to implement or modify a Cobol program. That saving carries over into keypunching as well, cutting down both work

load and the potential for error, Occidental claimed.

Described as ideal for structured programming, systems development and the conversion of programs written in other languages, Autocobol will operate on a system with ANS Cobol facilities.

The package costs \$2,760 or \$136/mo. Occidental is at 6666 Valjean Ave., Van Nuys, Calif. 91406.

## 'Capdet' Plans Waste Plants

MORRISTOWN, N.J. — Engineers can design wastewater treatment plants and estimate how much they will cost to build, operate and maintain by utilizing the Computer-Assisted Procedure for the Design and Evaluation of Wastewater Treatment Systems (Capdet).

The program can produce multiple designs that meet effluent criteria, then rank the preliminary designs according to their estimated annual costs.

### Available Through BCS

Developed by the Environmental Protection Agency (EPA) and the Army Corps of Engineers, Capdet is available through Boeing Computer Services Co. (BCS).

Information about Capdet or special training courses is available from Wen Huang, Priorities and Needs Assessment Branch (WE-595), U.S. EPA, 401 M St. S.W., Washington, D.C. 20460.

People interested in using the Capdet model should contact the Capdet project manager, W. Aikens, at P.O. Box 24346, Seattle, Wash. 98124.

## LSI-11 Files Sent, Received

IRVINE, Calif. — A file transfer program that allows users of Digital Equipment Corp. LSI-11 microprocessors to send or receive text or binary files from unattended, autoanswer remote sites is available from Unique Automation Products, Inc. (UAP).

The Eztran package reportedly gives programmers the capability to execute remote command files.

### Message Mode

Eztran features a command language with security protection and easy-to-understand error messages, according to a spokesman. An interactive message mode can be used to communicate with a remote site.

All transactions are logged to provide an audit trail when a file transfer is driven by pre-defined procedures. Transmitted data is also checked for line errors, the vendor reported.

Eztran costs \$1,500 per local/remote set. Each additional remote costs \$250, UAP noted from Suite L, 17922 Sky Park Circle, Irvine, Calif. 92714.

### Correction

The Requestor Information Management System/Mechanized Program Generator (RIMS/MPG) software costs \$7,500, not \$750 [CW, Dec. 3], according to a spokeswoman for the vendor, Information & Systems Research, Inc.

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demultiplexing in your network nodes may be awfully attractive.

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## Data Briefs

### IBM 3278 Replaced By MDS Terminal

COSTA MESA, Calif. — Mohawk Data Sciences Co. (MDS) will soon start delivering a CRT terminal it said is plug-compatible with IBM's 3278 series hardware and software.

Joined to an IBM 3274 controller in clusters of up to 32 units, the Trivex Plus 80 supports IBM 360, 370, 4300, 8100 and 30 series processors as well as the IBM 3790 communications processor, MDS said. Users can select from six detachable keyboards for processing both Ebcidic and Ascii character codes.

The Plus 80/2, a 1,920-char. display with 75-key typewriter, costs \$2,353. It can be leased for \$58/mo under a two-year plan.

MDS is located at 3180 Red Hill Ave., Costa Mesa, Calif. 92626.

### Limited-Distance Modem For Asynchronous Units

NEWPORT, R.I. — An asynchronous limited-distance modem designed to transmit digital data over unloaded local phone company loops or customer-owned metallic circuits is available from Avanti Communications Corp.

The Avanti 600 modem runs at speeds up to 9,600 bit/sec with an RS-232C interface and conforms to Bell Publication 43401 for frequency vs. power output.

The modem is available in a desktop unit or rack-mounted module. It costs \$300 from Avanti in Aquidneck Industrial Park, Newport, R.I. 02840.

### Manual Aids Purchases

NEW YORK — A "Data Communications Procurement Manual" is available from McGraw-Hill Publications Co.

Costing \$24.50, the 150-page manual includes specifications for 38 data communications devices as well as sample solicitation formats.

McGraw-Hill is at 1221 Ave. of the Americas, New York, N.Y. 10020.

## With Debut of Terminal Stored Mailgram Enhanced

McLEAN, Va. — A "fourth-generation" CRT terminal developed exclusively for Western Union Electronic Mail, Inc. (WUEM) now enhances store-and-forward opportunities for customers of that carrier's Stored Mailgram service.

Developed by Digi-Log Systems, Inc., the Mailgram Mark IV terminal is the first major enhancement to Stored Mailgram since Western Union Telegraph Co., WUEM's parent company, pulled out of a deal to support the domestic electronic mail system proposed by the U.S. Postal Service [CW, Dec. 10].

However, Stored Mailgram still relies on the Postal Service to get the customer's message delivered (see illustration on Page 22).

### Data in Virginia

"Stored Mailgram users keep frequently used texts, key paragraphs and mailing addresses at McLean," a WUEM spokesman explained. With a Stored Mailgram CRT terminal, a user can transmit a message to the McLean computer facility, where WUEM will append the customer's selection of stored data to the message and forward it to specified parties as a Mailgram.

The Mark IV allows transmission of such Mailgrams to "hundreds or even thousands of organizations anywhere in the 50 states or Canada for delivery with the next business day's mail," the spokesman claimed.

In the Mailgram mode, the Mark IV can store 13,440 characters, representing seven "screens" of information. Previous Mailgram terminals could only hold one screen of data at a time.

A Digi-Log spokesman added that 16,000 characters — eight screens — can be stored in a "general-purpose" mode.

According to the Horsham, Pa., vendor, the Mark IV's editing features allow the user to insert

or delete characters or full lines of stored text and to erase a partial or complete line or page.

The general-purpose mode reportedly involves use of the terminal as an interactive Ascii code device — suitable for time-sharing — for transmissions up to 1,200 bit/sec.

The Mark IV contains a 300 bit/sec acoustic coupler that allows communications over the public telephone network

through a conventional phone handset, the Digi-Log spokesman added.

Transmission speeds are user-selectable via the keyboard's special function keys.

Although the Mark IV can serve a number of applications besides stored Mailgram, users can acquire the terminal only by participating in the Mailgram service; it is not available for out-

(Continued on Page 22)

## Two CRT Terminals Work With DG Units

WESTBORO, Mass. — Data General Corp. has released two CRT terminals for asynchronous interactive communications up to 9,600 bit/sec.

The Dasher D100 and D200 terminals are aimed at users of DG's Eclipse, Nova, Micronova and Commercial Systems (CS) processors. The terminals display up to 1,920 alphanumeric characters arranged in 24 lines with 80 characters each.

A 7 by 11 dot matrix cell represents 96 upper and lower case Ascii characters, a spokesman said. With 12-in. recessed screens, the Dashers offer typewriter-style keyboards with 14-key numeric clusters — features intended to complement standard office environments.

The D200 has a 12-key "screen management" keypad and a 15-key function keypad in addition to the character board. A subset of the D200 functions is offered by the D100, the spokesman added.

Keyboards and keypads are detachable; the displays tilt and swivel. Various type fonts are offered as options.

The Dashers are supported by DG's Fortran IV and Fortran V, RPG-II, Extended Basic, DG/L, PL/I and Algol. The D200 also

handles the vendor's Interactive Data Entry/Access (Idea) software as well as its Interactive Cobol/Business Basic package and the recently introduced AZ-Text software for word processing.

### Typical Applications

DG named manufacturing, banking, insurance, laboratory health care and small business as typical applications for Eclipse, Nova and CS users. With Micronovas, the Dashers were termed suitable for small business, data acquisition, industrial automation and instrumentation.

The models 6106 and 6107 of the D100 cost \$1,750 and \$2,150, respectively. The Model 6106 is the basic D100; the 6107 is the D100 plus a slave printer interface and an optional means of splitting transmission speeds.

The Dasher D200 comes in the models 6108 and 6109, costing \$1,950 and \$2,350, respectively. The 6108 is the basic D200; 6109 is the D200 plus slave printer interface and the split-speed option.

Quantity and OEM discounts are available, DG noted from its headquarters on Rt. 9 in Westboro, Mass. 01581.

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## Extraterrestrial Menace — Part 2

# Protection of Future Satellite Systems Complex

By Kap S. Kim  
And Paul Woods  
Special to CW

Future satellite systems will be capable of multiple routing, space segment processing and switching, dynamic satellite bandwidth allocation for efficient use of the satellite and other sophisticated processing by both ground and space segments.

The protection of these future systems will be more complex, but cryptography advances we are seeing today can be applied to meet these requirements.

New systems will generally consist of the following elements: the ground links from user facilities to the earth station; signal processing at the earth station; the satellite uplink; signal processing at the satellite; and the satellite downlink.

The ground links will become protected through the use of protocol-sensitive, end-to-end encryption equipment operating in the data rate ranges known today. Several manufacturers are already selling equipment with this capability.

An additional requirement for the ground links will be to protect the user and the earth station. This extra protection could be provided by equipment very similar to what is currently available, but with

the added capability to switch encryption keys rapidly.

This would allow designated information to be decrypted by the earth station processor

*In this, the concluding article of a two-part series on satellite DP security begun last week, the authors indicate how in the future different approaches to cryptography may prove necessary when data communications leaves the earth.*

which has the appropriate key. All other data would remain protected from decryption because the processor lacks the right key.

In the earth stations, the encrypted data will be concentrated and formatted for effective transmission over the satellite. Routing, signaling and control information will be added to allow processing in the satellite or in the receiving earth station.

Such information, along with the data to be transferred, will be protected by equipment which can perform encryption at the speeds and in the form required by the satellite transmission medium.

To better utilize the satellite, new systems will use time-division multiple access (TDMA) techniques to employ the satellite's full bandwidth and multiple access capabilities. The higher speeds and burst operation

will require encryption equipment that does not exist today; however, some LSI circuits are available that can perform the necessary encryption

operations at the required speeds.

Commercial use satellites with on-board processing capability for communications are not presently in orbit, but the capability to perform communication processing in a satellite has been demonstrated in the past.

The usefulness of this type of processing is just now being explored for communications. As these concepts are formulated, an important con-

sideration will be the protection of the processor and of the data being processed. Cryptographic equipment will be necessary to provide this protection on board the satellite.

The receiving path from the satellite to ground will have appropriate decryption at the earth station and user facilities. At the earth station, the decryption may not follow the same format as the encryption because of processing of the satellite or because of the transmission means employed.

The equipment that does the decryption could thus be operating differently and independently from the encryption equipment. This possibility presents a departure from present approaches in cryptographic equipment.

The area of cryptographic key management is not the topic of this article, but it must be mentioned with respect to

the more complex security systems of the future. As the security features become more complex, a workable key management system will be required. New in cryptography is the public key approach.

This approach holds a lot of potential for satellite communications where cryptographic key transfers are difficult because of the geographical distances and the inaccessibility of the satellite when it is actively engaged.

In the future, more extensive security requirements could be provided through more advanced cryptographic techniques.

Kim is director of transmission engineering for American Satellite Corp. Woods is principal engineer for Fairchild Space and Electronics Co. Both companies, subsidiaries of Fairchild Industries, are based in Germantown, Md.

## Printer Available for IBM 3271

ATLANTA — Variable-size characters, a host of font options and various print functions highlight a 300 line/min printer compatible with IBM's 3271, 3272 and 3274B terminals.

The Label/300 device from Technical Analysis Corp. (TAC) has a variable aspect ratio feature to give users characters .1 in. to 2.8 in. wide. Font options give italics, reverse (white letters on black background), half-tone and overprinting, TAC said.

OCR-A characters, vertical and horizontal bar code and custom logos can be generated to facilitate the tracking of work in progress, TAC noted.

Special print features are activated when a standard line of data starts with a special control command. No other special programming is reportedly necessary. In fact, TAC said the Label/300's functions are determined solely by the data sent to it.

Besides interfacing IBM 3270 controllers, the printer can be connected to most available host CPUs, TAC claimed.

The Label/300 comes in four models: the Model 1C with RS-232 or 20mA current-loop interfaces, costing \$8,500; the Model 1C/P1 with parallel and Centronics Data Computer Corp.-compatible interfaces, for \$8,500; the \$9,250 Model IC 3270 with 3271 and 3272 interfaces; and, for \$8,500, the Model 1C/S7 with interfaces for the IBM System/7 or to replace Data-

cost up to \$9,450.

For \$250 each, Label/300 options include a bar code module, OCR-A module, line drawing module, reverse paper feed, "easy access" cover and tungsten carbide hammers

for high carbon ribbons. The custom logo capability costs \$1,000 for the first logo and \$250 each for additional logos.

TAC is located at 120 W. Wieuca Road N.E., Atlanta, Ga. 30342.

## Stored Mailgram Enhanced

(Continued from Page 21)  
right purchase.

Instead, a \$110/mo "hard ware surcharge" is set by WUEM, which wants a customer commitment of at least six months, according to a spokesman.

Stored Mailgram rates vary,

according to message volume, in the range of \$1.40 to \$2.50 per message.

More information is available from Nanci Scala, manager of products and services at WUEM, 1600 Anderson Road, McLean, Va. 22102.

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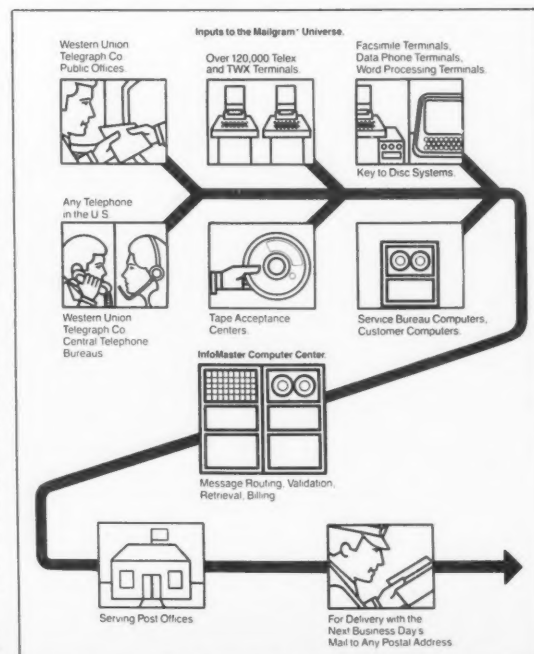
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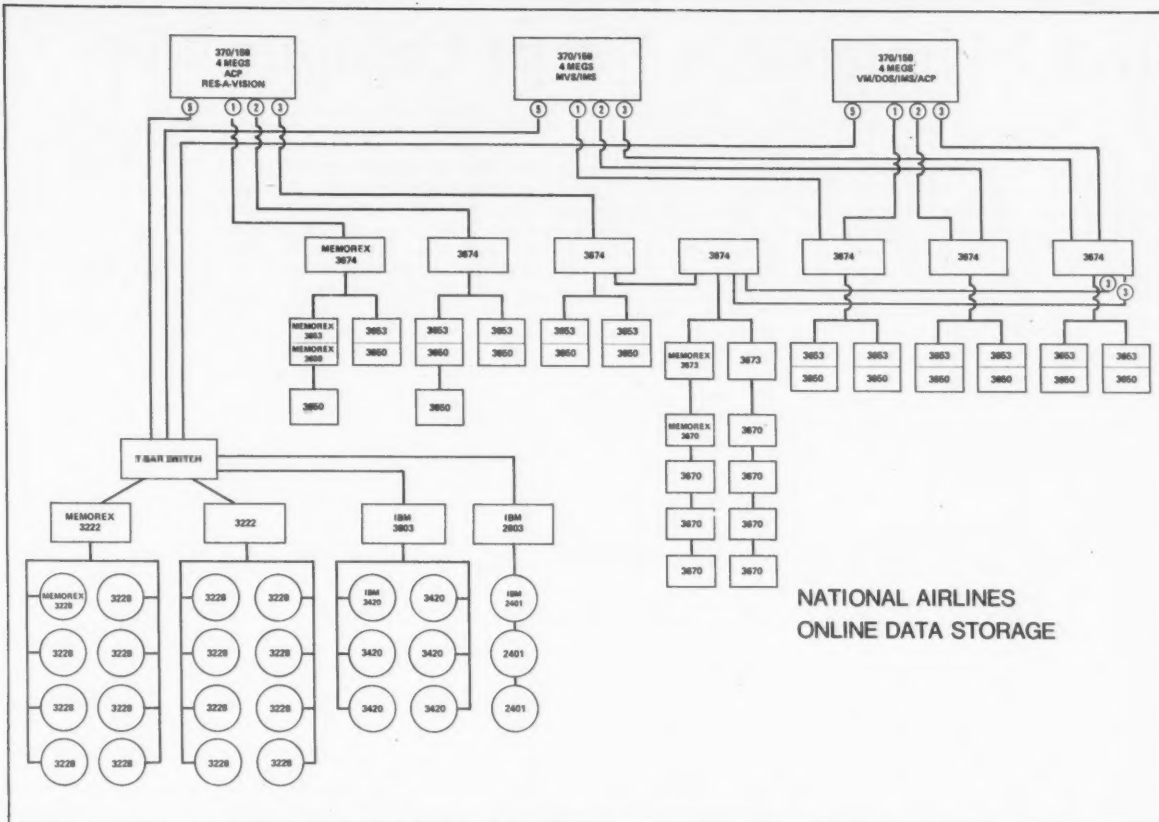
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How Stored Mailgram Works



Only two errors were detected when National Airlines tried out this system at Thanksgiving.

## Thanks to High-Density Disk Airline Ready to Meet Christmas Rush

By Connie Winkler  
CW Staff

MIAMI — National Airlines is ready for the Christmas travel rush — and the weather — with a new high-density disk storage system.

The system completed an error-free test run over the busy three-day period before Thanksgiving Day. "We are real proud of what we have done over the past four years and the Memorex Corp. 3650 is the latest," said Fred E. Luhm, director of computer and communications services at National.

What makes the National move extraordinary is that the Memorex 3650S replaced IBM 2314 disks, which until two years ago had been running on an IBM 360. National is the first 24-hour airline reservations operation to leapfrog from 1960s' disk technology to the 3650.

In the three-day test period before Thanksgiving, the computer data base was accessed almost 40 million times. Two errors were detected and self-corrected.

"We thought there had to be a mistake in our monitoring," Woody Hanson, senior manager for technical services, recalled. "We couldn't believe that any system could be that error-free under such hectic conditions, so we double-checked our programming, sure that we would find an error. We didn't."

National has averaged a response time of 1 sec and disk uptime of better than 99% since the Memorex 3650s were installed in November, Hanson said.

The disks have also meant a better weather-watching technique for the airline. National's Miami computers communicate over a 2,400 bit/sec line to the U.S. Weather Service computer in Kansas City, then strip off all weather information pertaining to National flights and routes, storing the information on disk.

Before a flight, all weather for the route is

retrieved and sent to the dispatcher and the crew. "This is saving us literally hours of paperwork," Luhm said. "Previously, weather from everywhere came in over the Teletype. Someone would have to sift through reams of paper to find the 'appropriate weather' for a particular flight. We can now have the information in a matter of seconds."

### 'Pretty Gutsy Decision'

Four years ago, Luhm and the five senior DP managers started a mammoth upgrade effort. "We sold a hard-nosed financial program. Our management is highly financial-oriented and we couldn't sell it on intangibles such as 'greater uptime gives better service,'" Luhm said.

After extensive planning, management approved third-party leasing of three IBM 370/158 mainframes. That jump from 360/30s, one of which was still emulating a 1401, meant moving from the DOS and OS/MVT operating systems to a complete MVS system, including the ability to handle the IMS data base management system.

The selection of the Memorex 3650 disks was the latest big step in this total DP program. The Memorex disks were better cost performers as well as highly reliable in competition with IBM's 3350s, Luhm said.

Moving from IBM to Memorex was a "pretty gutsy decision," according to Luhm. He said he has since noticed a decrease in marketing support from IBM, although IBM continues to maintain the remaining IBM equipment.

"We had a pretty active program with IBM," Luhm said. "We were in such a development period and were evaluating a lot of equipment."

The next and last step in National's new operation will be selecting and installing 1,000 terminals around the country for National's ticket offices and travel agents.

Disk systems and the airlines data base is crucial to National's operations. "We have tremendous packing requirements in the winter," Luhm said. "We have one million name records in storage on disk."

In the winter, 30% of the applications and 60% of the staff time are devoted to that data base.

At Thanksgiving and Christmas, as many as 40 inquiries arrive each second, from National's own ticket agents and from independent travel agents. An around-the-clock on-line reservation system is as important to the travelers as the fleet of jets.

Disk drives store immediate data. When a prospective traveler phones requesting flight information, an operator enters the route requested on a terminal. The CRT shows flights available, times and dates.

After the traveler makes his choice, the selection goes directly into the data base. Notations on special diets or special conditions of travel — for handicapped travelers, for example — are stored at this time.

Several days before the flight, the data base is accessed once again, and a boarding list with dietary information for passengers on a given flight is forwarded to caterers. Once a flight is over, all information is transferred to the Memorex 3220 tape drives for storage — data which can later be used for government reports and for National's route and passenger analyses.

There are 26 spindles of 3650 disk drive, with a maximum capacity of 317.5M bytes/spindle. Disks have a transfer rate of 1.198M bytes/sec and an average access time of 25 msec.

The IBM 2314 system had 54 spindles at 30M bytes each. This reduction in the number of disks means National has stayed in the same facility, but gained a greatly increased storage capacity, Luhm said.

The 3650s are controlled by 3653 direct access storage module controllers.



# Preventive Maintenance Keeps Campus New

By Marguerite Zientara  
CW Staff

FORT WORTH, Texas — By using a computer-based program for maintaining its heating, ventilation and air conditioning equipment, the Northwest Campus of Tarrant County Junior College here can do the same amount of maintenance work as in a manual system, but using fewer personnel.

Claiming to be the nation's only "Bicentennial Campus" because it opened in early 1976, Northwest Campus houses all its educational facilities, except the health and physical education building, under one roof on five of the campus' 193 acres.

Right from the start, campus management decided to avoid emergency-type maintenance situations based on the "run-to-failure" method, explained Lee Slaughter, former physical plants director, who has since taken a job as energy consultant in the University of Texas System.

The alternative was simple: with a select maintenance crew and new equipment, all the school had to do was properly maintain the physical plant.

Developing a well-organized

and smooth-running preventive maintenance program, however, is not as easy as it might seem, even with new facilities, Slaughter noted. With 190 pieces of equipment, a regular program of preventive maintenance would require an accurate inventory of equipment as well as the procurement of maintenance recommendations from each equipment manufacturer.

Another drawback was paperwork. "One of the major problems in preventive maintenance operations is getting the information necessary for day-to-day maintenance on a

regular basis and within a certain time frame," he said.

Deciding the campus would need outside help, in 1978 the group called upon Honeywell, Inc.'s Maintenance Manager Program. "I didn't want our chief maintenance operator on the campus to have to rely on a lot of written notes scribbled on the backs of envelopes," Slaughter said.

The Honeywell crew immediately began inventorying Northwest Campus' equipment. It spent a week preparing a list of each piece of equipment and its precise location, manufacturer and

model number.

The inventory information was fed into the Maintenance Manager computer at Honeywell's Data Center in Minneapolis, where a data bank supplied the manufacturer's recommended maintenance for each piece of equipment listed.

The computer then compiled the information necessary for Slaughter's team to maintain the Northwest Campus equipment in topnotch condition. Once a month, the group receives printouts detailing assignments and work orders.

The assignment log details each work category (controls,

refrigeration, heating, etc.), location (by building) and estimated work hours and number of jobs during each month. Five members of the maintenance staff of 58 on the Northwest Campus manage the preventive maintenance program.

"We can do the same amount of work with fewer personnel because we have increased efficiency," Slaughter said recently.

The preventive maintenance work order generated by the Honeywell program gives the worker a detailed description of the machine involved, its location and the maintenance needed.

## Permanent File

One of the advantages of the system, according to Slaughter, is that the computer-generated work orders provide a check on the system because they are kept as a permanent file.

"The program also gives us a complete parts inventory which allows us to keep needed parts on hand," he added. "It tends to make our maintenance program more of a strictly 8-to-5 operation instead of one that includes working on weekends and holidays."

The campus also utilizes an optional Honeywell service that lets the group control costs and plan future budgets. Staff members fill out a labor and materials record that shows the hours spent each week on maintenance and repairs, with a description and cost of materials used.

From this record, Honeywell's computer produces a monthly "Labor Hours History and a Maintenance Cost Report." The cost report shows the total hours and material costs in the various work categories.

## Let DP Evolve as Business Grows, Maker of Paint for Sears Advises

DES PLAINES, Ill. — Nicholas A. Vittore, director of corporate data processing at DeSoto, Inc. here, believes that a "computer system must mature as your business matures."

At DeSoto, an information system for transmitting data between customer and supplier has evolved over a 12-year period. Its system of transmitting data to one of its major customers — the nation's largest retailer, Sears, Roebuck & Co. — has developed with step-by-step additions of computer equipment, rather than by discarding a whole system and starting from scratch.

DeSoto is a paint manufacturer and a maker of furniture, detergents and cleaning compounds. The company supplies protective coatings for the interior and exterior of airplanes, refrigerators, washers, dryers and other appliances, makes marine finishes and formulates and manufactures specialized reprographic coatings for use with the electrofax method of photocopying. Its 1978 sales were \$321.4 million.

The company supplies more than 90% of Sears' paints and a major part of Sears' furniture and fireplace accessories. Its paint plants are located throughout North America.

### Direct Orders

DeSoto's DP equipment at its headquarters office originally performed only accounting functions. When Sears installed an IBM system which allowed its computer to transmit orders directly to DeSoto's plants, only three of DeSoto's 11 plants had computers capable of receiving these orders.

Orders for the other plants were sent first to DeSoto headquarters, processed there and then relayed to the plants. DeSoto has expanded and upgraded its equipment not only to accommodate Sears and to

take advantage of the time- and labor-saving opportunity, but to streamline its own operations as well and better serve its customers.

DeSoto has had a Honeywell, Inc. mainframe here at its headquarters office since 1968 and, since 1977, another at Jackson, Miss. Through the years these have been upgraded to take advantage of new computer technology, culminating in the installation of Honeywell Level 64s at both sites in 1977.

In 1976, Honeywell 716 minicomputers were installed at eight paint plants, one furniture factory and two other facilities that make fireplace accessories. The selection of specific computer models was determined by the nature of the business; the furniture plant at Jackson required a computer with greater capacity than the paint plants.

One Honeywell Level 6 minicomputer recently replaced an older 716; Vittore expects to replace all the older models with the new minis by sometime in 1980.

### Compatible Communications

To integrate the Sears IBM computer with DeSoto's Honeywell, DeSoto installed a device manufactured by Mitron Corp. that is compatible with both, enabling the computers to communicate with each other on the ordering program. For invoice preparation, DeSoto uses the Level 64 and transmits the invoices and shipment information back to Sears via equipment already in-house, manufactured by Four-Phase Systems, Inc.

"We originally chose Honeywell computers because of relative price, performance capability and upgradability," Vittore said. "For our needs, they work well."

Under DeSoto's original data handling system, orders were received by mail and processed at headquarters, except

for the three plants with computers of their own. Orders received at headquarters were keypunched, printed and mailed to plants. Orders received at plants were processed there, with only financial data being sent back to headquarters.

As with all such systems in operation at that time, there were delays resulting from the slowness of the mail, human errors in processing and hours of labor required to centralize all information to coordinate manufacturing, inventory control and invoicing.

As Sears became able to submit orders electronically in a machine-readable format rather than by mail, DeSoto expanded the capacity of the headquarters computer then in use. Then the Honeywell 716 minicomputers were added at the eight plants that had no computers. The plants' minicomputers receive and send only from and to the Des Plaines headquarters computer, not to and from Sears.

Once the system was consolidated, many benefits became possible. Paint division management received more timely information for manufacturing and inventory control. Shipment information from the minicomputers at the plants is now transmitted to the Level 64 at headquarters where it is used to create invoices to be transmitted directly to the Sears' computer, through the same network over which DeSoto receives orders.

DeSoto receives orders the same day Sears sends them, and delivery is made on the next receiving date for the store ordering the merchandise. For Sears, the need to maintain a large inventory is reduced because delivery is quicker and DeSoto plants can immediately begin producing products which may be in short supply.

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# 'Quiet Consensus' of Annual Meet Field Service Top Concern of DG Users

By Ann Dooley  
CW Staff

NEW ORLEANS — Field service — or the lack thereof — appeared to be the major concern of Data General Corp. users at the company's annual users group meeting here recently.

For the first time, DG officials from various departments fielded questions for more than an hour in the nearly filled lecture hall. Although the questions touched upon a wide range of subjects, there seemed to be a quiet consensus among the audience that field service did not satisfy users' demands

— even though DG has been pouring money into its field service operations in an effort to keep up with those demands.

## Major Effort

Comprised mainly of OEMs, systems houses and large-scale users, the audience heard that DG will make a major effort in 1980 to enlarge its inventory and thus provide for better field service maintenance. DG also plans to dedicate itself to bringing about four-hour maintenance in 1980, a panel of officials indicated.

The limited technical expertise of some

software servicepeople will also be "cracked on hard," one questioner was told. Although at least 1,000 work days a month are spent on training field service personnel, the difficulty lies in training one person to be knowledgeable in both software and hardware, the panel claimed.

## Escalation Program

DG also plans to eliminate much of the finger pointing that sometimes occurs between field engineers and systems engineers over the responsibility for assessing a system's problem. DG is about to implement an escalation program, so that when a problem's source is difficult to detect, the field engineer will call for help from the district technical support office, and then from the regional support office, and finally from the national technical support office until the solution is determined.

The program will bring additional resources to bear so the answer can be found in the shortest amount of time. This should eliminate finger pointing since everyone will be involved in finding the solutions, the DG spokesmen claimed.

Currently being tested, the new program will solve some of the problems, but the number of field personnel will never be on a level with the number of installations. That would create too much overhead and DG will never be that resource-rich, the panel maintained.

In the future, training will be concentrated so that a serviceperson who is qualified to solve general problems will get into the field sooner and, once there, receive further specialized training, the users were told.

Users also had questions about specific products and DG's new method of swapping boards rather than replacing chips, but most users seemed satisfied with DG's products and their reliability and performance.

## DDP to Be Major Industry Focus Of 1980s, DG Users Group Told

By Ann Dooley  
CW Staff

NEW ORLEANS — Some call it revolutionary, others call it evolutionary — but whatever its past, distributed data processing (DDP) will become the industry's major focus in the 1980s, according to Jim Perry, senior marketing specialist for Data General Corp.

Speaking at the recent DG Users Group Annual Meeting here, Perry told the audience that DDP started from the ground up since it was introduced by small independent companies rather than by the industry leaders — the mainframe vendors. But the concept has subsequently been endorsed by vendors of intelligent terminals, minicomputers and mainframes, Perry claimed.

Distributed data processing emerged be-

cause of a void in the existing large system-oriented product line and also because the technical expertise for DDP existed on a level that did not compete with mainframe technology, Perry explained. Additionally, as companies dispersed — often internationally — the need for dispersed systems grew, he noted.

Instead of one large data center, companies can use DDP as a means to disperse data entry to local sites, replicate data bases at individual stations and distribute applications among multiple machines. But, in switching to distributed processing, managers must determine whether to also distribute management control or to retain centralized control, Perry warned.

Perry outlined several trends top managers should examine before making a decision whether to implement DDP in their installations.

First, Perry noted that personnel and soft-

(Continued on Page 26)

## Tektronix Unveils Desktop Plotter

BEAVERTON, Ore. — Tektronix, Inc. recently introduced a desktop plotter that produces high-resolution graphics and alphanumeric characters from CRT screen displays for Digital Equipment Corp. Minc mini-computer systems.

The 4632 Option 8 Video Hard-Copy Unit is factory-calibrated to DEC's Minc, Miniminc and VT105-based DecLab-11/MNC machines. The unit is reportedly suited for copying raster scan displays containing graphics, including special symbols and multifont alphanumeric characters.

The device utilizes a dry-process development system to produce copies in 18 sec, or subsequent copies of the same display in 8 sec. Dry-silver paper is used for image quality.

The plotter unit includes a 10-ft interconnecting cable and costs \$4,595 from Tektronix at P.O. Box 500, Beaverton, Ore. 97077.



The Tektronix 4632

## Mini-Based Hospital System Provides for Managers, Users

By Ann Dooley  
CW Staff

NEW ORLEANS — A Pittsburgh multi-hospital health service has installed a mini-computer at one hospital and terminals at another to increase the knowledge of management while decreasing the uncertainty of the user departments.

Guy Hess, director of information at Forbes Health System, explained to a group of Data General Corp. users attending the DG Users Group Annual Meeting here recently how the Forbes system was planned, developed and installed.

To begin with, Hess told the audience the system's success was a result of the close interaction and support of top management. The information systems department head reported to a senior vice-president and then to the president, as would any other hospital administrator, thus keeping top management closely informed of the system's progress.

In devising a large information system, the end results must be accurate, timely and efficient, Hess said. The minicomputer chosen for such a system was the DG Eclipse C/330 with 256K bytes of memory and three Zebra drives.

The hardware is located at one hospital, the East Suburban facility, which currently has 28 terminals located in the inpatient, outpatient, emergency, family practice, quality assurance, medical records, pharmacy, ra-

diology and cashier departments. The terminals, which are a mixture of Digital Equipment Corp. Decwriters and others, are hard-wired to the Eclipse.

An additional 23 terminals are located at Columbia, the second hospital, and are attached to the hardware over telephone lines using special modems.

## Real-Time Processing

The system provides flexibility by allowing real-time processing in both hard-wired form and over phone lines, Hess noted. DG was chosen because of its reportedly high performance and excellent uptime, although Forbes contracted with a third party for maintenance rather than relying on DG.

The system is operational 24 hours every day, Hess said, adding that the uptime on the Eclipse and other peripherals has been better than 99% since the system was installed in April 1978.

The patient information system provides data on inpatient/outpatient registration, admissions, transfers and patient information and recall, Hess stated. The system called Doctor Communications provides a utilization review listing the different illnesses and how they should be treated, the medical records discharge statistics and the medical history.

The pharmacy system provides data on drug mixes, narcotic control, drug interac-

(Continued on Page 26)

INTENTWORKS



# DDP Seen Upcoming Industry Trend in 1980s

(Continued from Page 25)  
ware maintenance costs are increasing while hardware costs are decreasing, indicating that machines are less expensive to maintain than people-related costs.

Technological trends, for example, show that as hardware declines in costs, improved manufacturing techniques are being devised, related technological advances are occurring, volume is growing and performance continues to increase — and all for less dollars, he said.

## Personnel Shortage

Perry also cautioned the audience that the demand for personnel exceeds the supply, particularly in some remote areas. The difficulty in finding experienced people is growing, and compensation requirements are being raised to attract more people, he added.

These factors need to be considered before decentralizing management and technical control in a DDP environment, he said.

Another factor to examine is the cost of software, which directly relates to personnel problems and is the most rapidly growing of all DP costs,

according to Perry.

Additionally, the lack of program development tools creates added costs in an effort to provide user-friendly systems, he said.

Management also wants budget control, accurate reporting and machine-user satisfaction. And the user himself is demanding more information locally — resulting in a reduction of clerical staff — as well as faster response time, more input control and more influence on the system design.

Managers must determine how all these questions relate to their specific installations, Perry said.

## Examining Alternatives

In deciding whether to use DDP as well as how to administer it, managers should examine all alternatives, Perry continued.

Under a centralized system, existing hardware can be upgraded, redundant systems can share the work load and software can be upgraded or modified, Perry explained.

This may result, however, in increased complexity in problem-solving, a greater need for redundancy, a greater need for talented specialists

and also a difficulty in scheduling work, jobs and training.

Distributed data processing results in simple data entry and report generation where it occurs. Users have access to computer resources and have compatible hardware and software for growth, Perry said.

But very remote sites can be a problem in servicing and maintenance and also in attracting qualified personnel.

In deciding whether to implement centralized or decentralized software development programming, managers

should determine their software capabilities, training requirements and hardware availability for program development and remote problem-solving, Perry said.

A manager must also determine the installation's processing capabilities for growth potential, software transportability and reliability. Another consideration is what kind of technical staff is available at remote sites and what kind of training would be required.

Before coming to a decision, the manager must account for peak load consideration, the

type of network and backup capabilities. Remote sites may have little backup or scarce networking capabilities, while peak loads might be a problem for a centralized site, Perry noted.

In order to justify switching to DDP, the manager must determine that it is cost-effective and can lead to better control, responsiveness, productivity and flexibility. In most cases, it will, according to Perry, who also stressed that the system must be centrally controlled or managed in order to be effective.

## Mini Provides for Hospital System

(Continued from Page 25)

tion and a patient profile. The laboratory system includes information on the specimen pickup schedule, work schedules and the lab profile.

The dietary system provides information on menu ordering and diet and food balance, Hess noted. Other systems include the EKG/EEG, radiology, surgery and respiratory care systems.

All information is kept on a live file for 60 days and is then transferred to an archival file, where it is kept for three years.

Employee acceptance of the system has been very high, Hess told the DG audience,

but it took a while for that acceptance to be won. As the system is introduced into more specialized areas, it becomes more difficult to sell to the employees, he said.

At the entry-level departments, employees were told about the new systems and not given too much choice about the introduction, whereas in the nursing or pharmacy areas, for example, these employees must be asked if they will use it and must eventually be won over by performance and results, Hess said.

It was important for Forbes to install a highly user-oriented system and maximum control

of the system was given to the departments, Hess explained. Although programming was still done by DP personnel, tasks such as reports were handled entirely by the individual departments concerned through built-in user instructions.

Users were very involved in assessing system priorities and system design, Hess claimed. Six months were spent with users on the hospital program to find out what modifications were needed, resulting in a very high user acceptance.

Other systems which are still coming up are the pharmacy and laboratory systems. The whole implementation will take nearly eight years, he noted.

The modular approach was chosen because, even though it may be more prolonged, it is more reassuring to employees and also ensures greater system reliability, Hess claimed.

## Guide Relates WP To Engineering

NEW YORK — Basic Four Corp.'s Wordstream Systems Group is offering a four-page guide that details word processing's relevance to the engineering field.

"Word Processing: Capital Idea for Engineering and Consulting Firms" was designed as a manager's manual and includes a list of possible word processing applications that fit into the engineering environment.

The guide is free from Wordstream at 300 E. 44th St., New York, N.Y. 10017.

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## DEC Offers Accessories For RL01, RL02 Disk Drives

MAYNARD, Mass. — Digital Equipment Corp. has announced a series of accessories and maintenance equipment geared for its recently introduced 10.4M-byte removable-cartridge RL02 disk drive.

The first offering is an automatic-cycle disk cleaner for RL01 and RL02 cartridges that cleans the disk surface in one three-minute operation.

The RL01 disk cleaner is priced at \$1,095 and includes materials to clean 50 cartridges, a spokesman said. A replacement supplies kit for cleaning an additional 50 disks sells for \$50.

The next options are groups of cabinets designed to store DEC's cartridge disks and a variety of computer supplies. The RKR01-CC model is a 19-in. rack-mountable unit that holds up to three RL01 or RL02 disks and costs \$115.

The H980 series, available in 61-in. and 73-in. versions, offers space for RL02 disks as well as for printouts and computer foam supplies, the spokesman continued. These cabinets are priced at \$399 and \$405, respectively.

An insertable rack for the H980 that holds 13 RL01 or RL02 cartridges is priced at

\$35.

DEC also has a small, attache-type case for carrying cartridges. With a shock-absorbing foam interior, the case sells for \$85.

Finally, the minicomputer manufacturer has additional cartridges for the RL02 drive that have a prerecorded format containing servo information for head-positioning, interleaved with data on the disk surface, to ensure alignment and data integrity.

Unit prices for the 10.4M-byte, 250-track/in. cartridges begin at \$199.

Additional information on RL01 and RL02 accessories is available from DEC at 146 Main St., Maynard, Mass. 01754.





# As Growth Continues in '80s Capital Woes Predicted for Semi Firms

By Jeffrey Beeler

CW West Coast Bureau

SAN JOSE, Calif. — Unless they exercise "substantial creativity" in raising investment capital, semiconductor firms will find themselves increasingly hard-pressed to finance their growth during the 1980s, the head of a local venture-capital firm warned here recently.

The semiconductor industry is fast becoming as capital-intensive as more mature businesses like steel, according to Capital Management Services, Inc. president Donald Valentine.

A typical integrated-circuit manufacturer today needs \$1 of capital investment for every \$2 of sales, and in the near future that ratio will almost certainly fall to about 1:1, Valentine said at the Semiconductor Equipment and Materials Institute's "annual out-

look" meeting here.

The constantly rising cost of capital expansion has prevented the semiconductor industry from achieving a wide enough profit margin to attract U.S. investors in significant numbers.

As a result, domestic semiconductor manufacturers have been forced to seek more and more of their investment capital from overseas, the head of the Menlo Park, Calif.-based company said. During the past 10 years, foreign investors have acquired all or part of 19 U.S. semiconductor firms, for a total investment of \$584 million.

## Not Only Problem

To be sure, the scarcity of growth capital isn't the only problem semiconductor companies will have to face during the 1980s. But most of these other difficulties — excessive government regulation, real estate shortages and a lack of skilled technical personnel — seem reasonably amenable to solution.

The capital-investment problem, by contrast, seems almost certain to continue indefinitely, Valentine said.

On the other hand, the company president predicted continued strong growth for the

semiconductor industry during 1980, as did another of the meeting's speakers, Joseph Van Poppelen, National Semiconductor Corp.'s vice-president of marketing.

"The fat cat won't be getting any skinnier," Van Poppelen said of the industry's business prospects for the months and years ahead.

By 1984, he predicted, the worldwide electronic equipment market will total \$221 billion, compared with \$117 billion this year and \$65 billion in 1974. Within that market, the computer sector will experience the fastest growth, with a 16% annual increase in sales volume through the next five years.

In the MOS memory sector of the electronics market, worldwide consumption has soared from eight billion bits five years ago to 1.3 trillion bits this year. By 1984, MOS memory use will increase to nine trillion bits, which translates into a 101% compound annual growth rate for the past 10 years, Van Poppelen said.

Worldwide microprocessor consumption, meanwhile, will rise from 57 million units this year to 300 million units in 1984, he added. In 1974, by contrast, microprocessor use totaled just one million units worldwide.

## Supershorts

Randal Data Systems, Inc. has secured a short-term extension on its secured credit line of \$630,000, and some of the firm's unsecured creditors have granted an "informal" 90-day moratorium on past-due obligations totaling some \$2 million. These unsecured creditors have also formed a committee to negotiate a reorganization of the firm's unsecured debt.

In other moves, Randal has pared its work force to a core of 12 workers, down from 50 employees. This is the second round of layoffs at Randal. John F. LaBarbera, chairman and chief executive officer, said the company's principal effort is directed at finding a suitable company to acquire Randal. He said the firm has contacted a dozen companies but would not reveal the names of those firms or whether a merger agreement is in the offing.

Lloyd's of London revealed it stands to lose \$340 million on insurance its collection of British underwriting syndicates wrote for computer leases. The latest loss estimate was prepared by the First National Bank of Boston, which is assisting Lloyd's in the U.S. A former loss estimate prepared by actuarial consultants Toplis & Harding earlier this year pegged the loss at about \$234 million.

Digital Scientific Corp., a San Diego-based manufacturer of minicomputers, has entered into a letter of intent for the sale of the company to Peter S. Redfield, formerly president and chief executive officer of Ite Corp. Under the terms of the offer, Redfield would acquire the firm's preferred stock and more than 90% of the common stock. The financial terms of the agreement were not disclosed. Digital Scientific's revenues are said to be about \$4.5 million this year, and the firm is estimated to have an installed base of \$25 million.

Hughes Aircraft Co., through its wholly owned subsidiary Hughes Communications, Inc., has filed an application with the Federal Communications Commission to build a U.S. domestic communications satellite system.

The application describes a system consisting of two 24-channel satellites and a ground spare. The system would cost about \$190 million to construct and launch. The first satellite could be launched as early as 1981 and would cover the 48 contiguous states, Hughes said.

## Mainframers' '79 DP Revenues Up Only 2.1% From '78 Level

CAMBRIDGE, Mass. — Combined 1979 DP revenues of \$29.4 billion for the seven largest U.S.-based mainframe vendors and plug-compatible mainframe vendors represent a meager 2.1% growth over 1978's \$28.8 billion, according to a recent industry outlook study compiled by Arthur D. Little, Inc. (ADL).

To combat this flattened growth and adapt to an increasingly competitive market environment, mainframers must begin offering products they have hitherto largely ignored, ADL industry pundits Frederic G. Withington and Oscar H. Rothenbuecher suggested. The vendors analyzed in ADL's 19th annual forecast of the world computer industry comprise 80% of the domestic industry.

The value of 1979 shipments of general-purpose computer systems is estimated at \$19.5 billion, up 6.5% from \$18.4 billion in 1978, ADL said.

IBM contributed significantly to the flat growth pattern for this sector, Withington and Rothenbuecher noted. IBM experienced a 4.5% decline in DP revenue and only a 3% growth in shipments this year, primarily because of users' preference for leasing rather

than purchasing large systems, they said.

Despite an expected surge in shipments of smaller IBM systems in the near future, Withington and Rothenbuecher believe the combined value of shipments for the vendors examined in the report will achieve a constant dollar growth of only 7% to 9% through 1984. Revenues for the group will rise faster, possibly averaging 10% to 15% per year in constant dollars.

To achieve that 15% growth, mainframers will have to be aggressive in pursuing communications equipment, office systems and other fast-growing product areas, the authors said.

Complicating the flattening growth curve for mainframers, the two experts see the share of mainframe overseas markets diminishing from 57% to 50% over the next five years. The improved position of local overseas manufacturers of small systems, the most dynamic of the overseas segments, will contribute to reduced overseas marketing activity for U.S. mainframers.

Consequently, ADL sees the competition heating up considerably as mainframers begin to seek new outlets away from the maturing large system business.

## GDC Poised for Recession — Or Growth, Chairman Claims

By Connie Winkler

CW Staff

NEW YORK — General Datacomm Industries, Inc. (GDC) is announcing a lease program this month which, in combination with recently announced modems, poises the company for either a climate of recession or growth, according to Chairman Charles P. Johnson.

Johnson, speaking to a recent meeting of the New York Society of Security Analysts, also predicted that Digital Equipment Corp. and IBM will be marketing modems in the next several years. IBM in France has just

announced 2,400-, 4,800- and 9,600 bit/sec modems, Johnson said.

"The market is big enough to appeal to other people," Johnson said, noting that today's data communications market is about \$500 million a year. He also predicted that Exxon Information Services will look at acquiring a modem firm.

However, Johnson suggested these newcomers will have problems. "There are no books on data communications. The only way to understand this business is to experience it."

(Continued on Page 28)

COMPUTER INDUSTRY

## Dataproducts Expecting Big IBM Printer Order

NEW YORK — Dataproducts Corp. is looking at a large OEM order from IBM for its small computer M200 matrix printer to bolster its financial picture. The order for the M200, which Dataproducts is customizing with IBM's assistance, could be the largest OEM contract for peripherals in the printer industry, Graham Tyson, Dataproducts president, told the New York Society of Security Analysts here recently.

The order with IBM's Systems Products Division could range from 5,000 to 30,000 printers totaling as much as \$100 million, a Dataproducts official said. IBM's M200, which will go into production in January, is expected to be part of an IBM system to be announced in February. The IBM contract has a generous escalator clause, Tyson said.

### Terminal Contract?

Dataproducts' Data Communications Division may also get a large contract for a series of interactive message terminals to duplicate the U.S. government's teletypewriter network.

Specifications for that contract were based on a Dataproducts prototype initially de-

veloped for the Air Force. If the Wallingford, Conn., division gets the federal contract in mid-1980, it could mean \$140 million to \$200 million over a five-year period.

### Several Problems

On the other hand, Dataproducts has had problems in its fiscal 1980, which ends March 30, including a five-week strike at the Ireland plant that manufactures line printers. The strike over which union would represent employees was recently resolved, Tyson said.

The firm has also had problems with heavy start-up costs for new products and longer-than-expected development times, Tyson said.

And, OEMs, which are Dataproducts' primary customers, are behind schedule on their own products because of software problems. Further, the market has been quite slow in adopting new products; customers want a longer evaluation period, Tyson added.

Despite all this, the president of the Woodland Hills, Calif.-based firm predicted a slightly profitable third quarter and a more profitable fourth quarter as the new products take off.

## Chinese Visits to U.S. Firms Scheduled for January, February

DALLAS — In recent months, many U.S. electronics firms have seemingly lost interest in the possibility of doing business in the People's Republic of China (PRC).

The dwindling interest has "stemmed from a conflict between the desire of U.S. companies to market their goods in China and the desire of the Chinese to gain access to U.S. technology [through joint manufacturing ventures]. Some U.S. companies that have traveled to China to sell goods have returned disappointed," Scott J. Grant, president of the China Consulting Group here, maintained.

His group is now organizing a round of U.S. company visits for Chinese officials representing more than 100 electronics firms in the PRC.

While some of China's goals for rapid industrialization have been scaled back recently, Grant said officials in charge of electronics production are looking for improved manufacturing bases in high technology. In particular, the Chinese are interested in manufacturing components, peripherals and small systems.

Grant said the environment in China offers advantages, especially when compared with some countries in Latin

America or the Far East where U.S. electronics firms have already established plants.

The PRC has hundreds of thousands of semiskilled workers and engineers available for guaranteed wages, Grant said.

Although selling will not be the initial thrust of these ventures, Grant pointed out that such ventures will pave the way for entry into the Chinese market once the PRC is ready to begin buying.

Although a number of Japanese and West German companies have made joint-venture overtures to the PRC, it appears the Chinese would prefer to establish arrangements with U.S. electronics companies, Grant said. He claimed the PRC officials are delaying any final decisions on joint-venture partners until after their visits to the U.S.

The visits organized by the China Consulting Group will take place over a six-month period beginning in late January or early February. There will be several tour groups, each consisting of four to six PRC officials and lasting one to two months. To date, 10 to 12 computer firms have made commitments to meet with the Chinese groups.

Further information is available from the China Consulting Group at Suite 1320, Oak Cliff Bank Tower, 400 S. Vangs, Dallas, Texas 75208.

## Soviet Processes Offered

NEW YORK — In partial payment for the \$60 million in hardware and software Control Data Corp. has sold to the Soviet Union, 30 Soviet technological processes are being made available in the U.S. through Control Data Worldtech and the Soviet foreign trading organization, Licensintorg.

One of the most promising is production of electric power by magnetohydrodynamic (MHD) techniques. An additional exchange of software is also being looked into, according to Robert E. Wesslund, CDC's vice-president, technology exchange.

These latest technologies will be added to more than 150 Soviet technologies represented by Worldtech and already listed in CDC's Technotec data bank for licensing to U.S. companies.

The Soviets will also be sharing their expertise in using computers in planning and operating control for bulk power systems.

## Ready for Recession, Growth

(Continued from Page 27)

Prior to the last recession, GDC announced new products and managed to maintain a 20% growth rate. Johnson said he hasn't yet seen any signs of a recession for 1980, but GDC has in the last several months armed itself with an arsenal of new products. The firm recently announced a fast-poll modem featuring microprocessor elements for internal signed processing. It has also added two multiplexers — one for statistical processing and one that multiplexes up to 46 Telex channels for national and international Telex networks.

Because of their price/performance, these products lend themselves to leasing, Johnson said. "When the economy gets tough, companies expand existing networks rather than start new ones," he added.

GDC has also recently logged in a five-year nationwide lease with Sears Roebuck & Co. to provide all its products and service.

Offering a complete product line has been GDC's key to success — something that other companies are now recognizing, the chairman said. "The multiplexer and modem

businesses have to be married," Johnson said.

"Our products were designed bottom up to work with the network — not pieced together," Johnson said. "The key approach is the network approach."

Johnson told the analysts his company's earnings growth rate this year may be closer to what sales growth has been in the past five years. Over the last five years, GDC averaged a 55% earnings growth rate and 33% sales increase. Johnson would not predict financial performance for the coming year.

### Other Announcements

Johnson also reported:

- Announcement of a new

DLC1 adaptive concentrator has been postponed from last month until after January 1, when the customer test site will be available.

- GDC intends to double its engineering staff from 125 to 250 in the next two years.

The new General Datacomm Systems, Inc. has been recently located in Hauppauge, N.Y., to specifically modify and manufacture the company's data communications products for sale to the federal government — but those sales are not expected to exceed 10% of the company's total business.

For fiscal 1979, the Danbury, Conn., company had sales of \$41 million and income of \$3.2 million.

## Contracts

System Development Corp. has been awarded a \$14.5 million, three-year contract, with a one-year option of \$5.6 million, from the U.S. Department of Transportation to provide DP services to the department's Transportation System Center (TSC) in Cambridge, Mass.

Harris Corp.'s Data Communications Division has signed a \$5 million band printer contract with Dataproducts Corp.

Recognition Equipment, Inc. has received a \$12 million contract from the European American Bank for bank transaction equipment.

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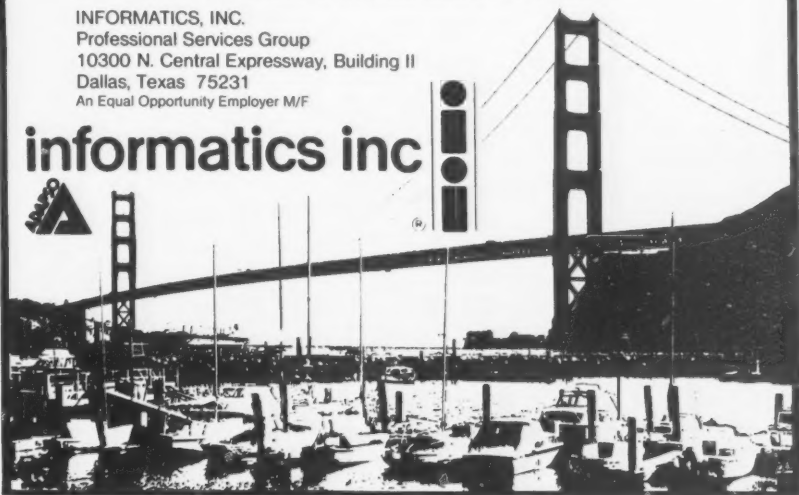
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Rogers and Associates offers an attractive salary and benefit program as well as planned personal development opportunities. If you possess the necessary skills and desire to pursue a career in consulting, we would be pleased to discuss your career plans in more detail.

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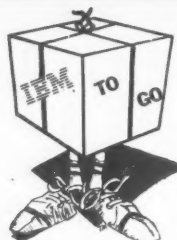
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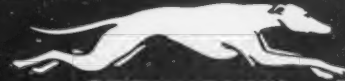
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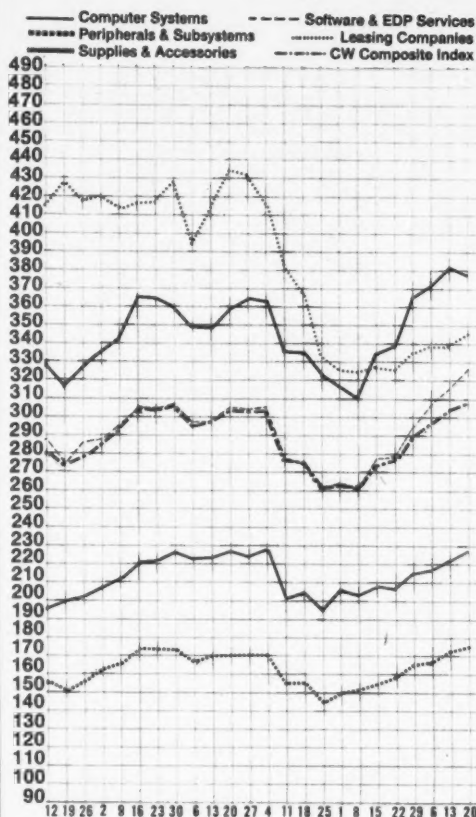
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CLOSING PRICES WEDNESDAY, DECEMBER 19, 1979

All statistics compiled,  
computed and formatted  
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Cambridge, Mass. 02139

PRICE							PRICE							PRICE									
	1978-79	CLOS	WEEK	WEEK				1978-79	CLOS	WEEK	WEEK					1978-79	CLOS	WEEK	WEEK				
H	HANGE	DEC 19	NET	PCT	H	H	H	HANGE	DEC 19	NET	PCT	H	H	H	H	HANGE	DEC 19	NET	PCT	H	H	H	H
C	(1)	1979	CHNGE	CHNGE	C	C	C	(1)	1979	CHNGE	CHNGE	C	C	C	C	(1)	1979	CHNGE	CHNGE	C	C	C	C
COMPUTER SYSTEMS																							
A	AMDAL CORP	17-69	25 1/4	- 5/8	-2.4	O	ADVANCED COMP TECH	1- 2	7/8	+ 1/8	+16.6	A	DATA ACCESS SYSTEMS	0-10	9 7/8	+ 7/8	+9.7						
N	BURROUGHS CORP	59-87	81	+ 1 3/8	+1.7	O	ANACOMP INC	8-24	17 3/4	+ 3/4	+4.4	A	DATA PRODUCTS CORP	13-25	19 3/4	+ 1/8	+0.6						
O	COMPUTER AUTOMATION	4-44	11 1/2	0	0.0	O	ANALYSTS INTEL CORP	3- 5	4 5/8	+ 1/2	+12.1	O	DATUM INC	2- 6	2 3/4	0	0.0						
N	CONTROL DATA CORP	23-57	54 7/8	- 1/8	-0.2	A	APPLIED DATA WES.	8-17	10 1/8	- 1/8	-1.2	O	DECISION DATA CORP	2- 6	2 3/4	+ 1/8	+4.7						
O	CRAY RESEARCH INC	8-51	44 3/4	-5 3/4	-11.3	N	AUTOMATIC DATA PROC	24-40	36 1/2	- 1/8	-0.3	O	DELTA DATA SYSTEMS	1- 1	3/4	+ 1/4	+50.0						
N	DATA GENERAL CORP	42-74	93	- 1 3/8	-2.5	O	COMPU-SERV NETWORK	5-18	18	+ 1/2	+2.8	O	DOCUMENTATION INC	6-34	17 3/8	-3 3/4	-17.7						
N	DATAPoint CORP	34-105	101 5/8	-3 1/8	-2.9	O	COMPUTER HORIZONS	1- 9	5 1/4	+ 1/2	+10.5	O	DUNN CORP	6-34	32 1/4	+ 1/4	+0.7						
N	DIGITAL EQUIPMENT	39-69	67	- 1/2	-0.7	O	COMPUTER NETWORK	5-16	6 1/4	- 1/2	-7.4	N	ELECTRONIC - & W	3- 9	1 1/2	0	0.0						
N	ELECTRONIC ASSOC.	2-13	6 3/4	- 1/4	-3.5	N	COMPUTER SCIENCES	4-20	19 1/8	- 1/4	-1.2	O	EVANS & SUTHERLAND	20-42	38 1/2	+ 1	+2.6						
A	ELECTRONIC ENGINEER	9-19	16 1/4	+ 3/8	+2.3	O	COMPUTER TASK GROUP	1- 7	6 3/4	0	0.0	O	FARRI-TEK	1- 2	1	+ 1/4	+33.3						
N	FOUR-PHASE SYSTEMS	19-46	44 1/4	- 3/4	-1.6	O	COMPUTER USAGE	4- 4	2 1/8	+ 1/4	+13.3	O	GENERAL COMPUTER SYS	1- 3	7/8	0	0.0						
N	FOXBORO	28-44	39 1/4	+ 1/2	+1.2	O	COMPUTER AUTO REP SVC	4-10	5 3/4	- 1 3/8	-31.4	N	GENERAL DATACOM INC	17-22	21 3/4	+ 1/2	+2.3						
O	GENERAL AUTOMATION	7-26	16	- 3/8	-2.2	O	CONSHARE	6-26	19 1/2	+ 3/4	+4.0	N	HAZELTINE CORP	10-21	20 1/8	+ 1/2	+2.3						
O	GRIFFIN COMPUTER CORP	1- 3	1 1/2	0	0.0	O	CULLINANE CORP	14-33	29 1/2	- 1/4	-0.8	N	HARRIS CORP	17-36	33 3/8	+ 1/8	+0.3						
N	HEWLETT-PACKARD CO	24-63	59 5/8	+ 1 5/8	+2.8	O	DATA DIMENSIONS INC	1- 9	2 1/4	0	0.0	O	INFOPAC INC	1-11	1 1/4	0	0.0						
N	HONEYWELL INC	43-85	83 1/8	+ 1/8	+0.6	O	DATAPART	1- 4	4	0	0.0	O	INFORMATION INTEL INC	7-12	8 3/4	+ 1/2	+6.0						
N	IBM	62-321	64 3/8	- 7/8	-1.3	O	DSI CORP	4- 6	6 1/4	+ 1 3/4	+30.8	O	INTECH	1- 3	2 3/8	- 1/8	-5.0						
O	MANAGEMENT ASSIST	9-29	19 1/4	- 1 1/4	-6.0	N	ELECTRONIC DATA SYS.	13-28	27 1/8	+ 1 1/8	+4.3	O	INTEL CORP	20-72	67 1/2	- 1 1/2	-2.1						
O	MANUFACTURING DATA S	9-35	35 1/4	+ 1 3/4	+5.2	O	INSYTE CORP	1- 3	1 3/8	- 1/8	-8.3	O	INTERSEIL	7-32	27	- 1 1/4	-4.4						
O	MINI-COMPUTER SYST	2- 8	3	+ 1/8	+4.3	O	IPS COMPUTER MARKET	2- 3	3	0	0.0												
O	MODULAR COMPUTER SYS	7-18	11 3/4	- 3/4	-6.1	O	KEANE ASSOCIATES	3- 6	6	0	0.0	A	LUNDY ELECTRONICS	4- 8	6 5/8	0	0.0						
N	NCR	37-91	70 1/2	+ 2 3/4	+4.0	O	KEYDATA CORP	1- 4	4	- 1/8	-3.0	O	MSI DATA CORP	6-19	8 1/4	- 1/2	-5.4						
N	PRIME COMPUTER INC	9-23	22 5/8	- 3/8	-1.4	A	LOGICON	10-19	18 1/4	+ 7/8	+5.0	N	MEMOREX	17-59	17	-4 1/8	-19.5						
N	PERKIN-ELMER	17-41	39 3/4	+ 3/8	+0.9	O	NATIONAL DATA CORP	1-17	14 1/4	- 1/4	-1.5	N	MOHAWK DATA SCI	0-16	15 5/8	- 1/8	-0.7						
N	SPEER JAND	33-52	50 3/4	+ 3/8	+0.7	N	PLANNING RESEARCH	4-10	9 7/8	- 1/4	-4.0	O	OMER	2- 8	8 1/2	0	0.0						
A	SYSTEMS ENG. LABS	11-24	18 1/8	- 1/8	-0.6	O	PROGRAMMED FAX SYS	3- 5	4 1/4	- 1/8	-2.8	N	PARADYNE CORP	9-25	24	- 1/8	-1.5						
O	TANDAM COMPUTERS INC	13-41	39 3/4	- 1/4	-0.8	O	PROGRAMMING & SYS	1- 1	3/4	- 1/8	-14.2	A	PENRIL CORP	5-14	13 3/4	- 5/8	-4.4						
A	WANG LABS.	6-32	30 5/8	0	0.0	O	RAPIDATA INC	7- 4	4 1/4	- 1/4	-5.5	N	PERTEC CORP	8-17	16 3/8	0	0.0						
						O	REYNOLDS & REYNOLD	10-36	28 1/4	- 3/4	-2.5	O	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0						
						O	SCIENTIFIC COMPUTERS	3-10	10	+ 1/2	+5.2	O	RANNEY CORP	7-14	12 3/8	- 1/4	-2.8						
						N	TYNESHARE INC	10-54	52 7/8	+ 3 1/8	+6.2	O	RECOGNITION EQUIP	5-13	5 5/8	- 1/4	-3.6						
						O	URS SYSTEMS	5-10	10	+ 1	+12.5	O	SCAN DATA	1- 5	1 1/2	- 1/8	-11.1						
						N	WYLY CORP	1- 7	5 3/4	- 1/4	-4.1	O	STORAGE TECHNOLOGY	14-46	17 5/8	0	0.0						
												O	SVES DATATECHNICS	4-20	22 3/4	+ 3 1/2	+18.1						
												O	T BAR INC	11-26	24	- 1 1/2	-5.8						
												A	TEC INC	0-13	5 1/4	- 5/8	-9.8						
												N	TEKTRONIX INC	33-63	61 1/4	+ 1 3/4	+2.2						
												N	TELEX	3- 9	1 7/8	- 1/4	-6.0						
												O	TESOATA SYSTEMS CP	4-26	11 1/4	+ 1/2	+4.0						
												O	TIMELEA INC	4-11	11 1/8	+ 3/8	+3.4						
LEASING COMPANIES																							
O	ROOTHE FINANCIAL CP	13-21	17	- 1/4	-1.4																		
O	COMDISCO INC	3-21	13 1/4	+2 1/4	+20.4																		
A	CONFERENCE GROUP CORP	1- 1	1 1/4	0	0.0																		
A	COMPUTER INVESTS GRP	1- 7	2 1/4	0	0.0																		
O	CONFIDENTIAL INFO SYS	3-15	1 1/4	+ 3/8	+13.0																		
O	DATACOM RENTAL	4- 4	2 1/2	+4	+7.7																		
A	DCL INC	3- 6	5 1/4	0	0.0																		
N	DPF	8-14	7 7/8	- 1/4	-1.5																		
O	ITT INC	4-36	5 1/4	- 1/4	-5.0																		
O	TELESCO CORP	24-68	58 3/4	- 1/8	-0.8																		
O	LEASACORP	1- 4	4	0	0.0																		
A	PIOWER TFA CORP	2- 7	2 1/4	- 1/8	-4.5																		
N	U.S. LEASING	12-20	15	+ 1/2	+3.4																		
PERIPHERALS & SUBSYSTEMS																							
N	AN INTERNATIONAL	13-32	15	- 1/8	-0.8	N	AN INTERNATIONAL	13-32	15	- 1/8	-0.8	O	WILFER INC	1- 2	1 1/4	0	0.0						
N	ANDERSON JACOBSON	10-19	20	- 1/4	-0.9	N	ANDERSON JACOBSON	10-19	20	- 1/4	-0.9												
N	APPLIED DATA SYS	0-22	4 7/8	+ 1/2	+5.9	N	APPLIED DATA SYS	0-22	4 7/8	+ 1/2	+5.9												
O	AUTO-TROL TECHNOLOGY	14-35	33	+ 3/4	+2.3	O	AUTO-TROL TECHNOLOGY	14-35	33	+ 3/4	+2.3												
O	BEETIVE INT'L	7- 7	7	0	0.0	O	BEETIVE INT'L	7- 7	7	0	0.0												
A	BOLT-BRENNER & NEW	10-29	18 1/4	+ 1 1/4	+4.3	A	BOLT-BRENNER & NEW	10-29	18 1/4	+ 1 1/4	+4.3												
O	BUNKER-HAND	10-29	2 1/4	+ 1 1/4	+4.3	O	BUNKER-HAND	10-29	2 1/4	+ 1 1/4	+4.3												
O	CAMBRIDGE MEMORIES	1- 9	2 1/4	+ 3/4	+4.0	O	CAMBRIDGE MEMORIES	1- 9	2 1/4	+ 3/4	+4.0												
O	COMPUTER DEVICES INC	5- 8	7 7/8	- 1/4	-3.9	O	COMPUTER DEVICES INC	5- 8	7 7/8	- 1/4	-3.9												
N	CENTRONICS DATA CORP	10-54	47 1/8	- 7/8	-7.7	N	CENTRONICS DATA CORP	10-54	47 1/8	- 7/8	-7.7												
O	CONTECHNICS	1- 4	2 1/4	0	0.0	O	CONTECHNICS	1- 4	2 1/4	0	0.0												
O	COMPUTER COMMUN.	6-10	5 1/4	- 3/4	-12.5	O	COMPUTER COMMUN.	6-10	5 1/4	- 3/4	-12.5												
O	COMPUTER CONSOLE	4-20	19 1/2	+ 1/2	+6.2	O	COMPUTER CONSOLE	4-20	19 1/2	+ 1/2	+6.2												
A	COMPUTER EQUIPMENT	1- 5	5 1/4	+ 1/4	+2.5	A	COMPUTER EQUIPMENT	1- 5	5 1/4	+ 1/4	+2.5												
O	COMPUTER TRANSCREIVER	3-55	51 7/8	- 2 1/4	-4.5	O	COMPUTER TRANSCREIVER	3-55	51 7/8	- 2 1/4	-4.5												
O	COMPUTER-VISION CORP	13-26	17	+ 1	+6.2	O	COMPUTER-VISION CORP	13-26	17	+ 1	+6.2												
SUPPLIES & ACCESSORIES																							
A	AMERICAN BUS FORMS	0-12	11 5/8	+ 3/8	+3.3	A	AMERICAN BUS FORMS	0-12	11 5/8	+ 3/8	+3.3												
O	BALTIMORE BUS FORMS	1- 4	1	0	0.0	O	BALTIMORE BUS FORMS	1- 4	1	0	0.0												
O	BARRY WRIGHT	14-34	23 1/4	+ 1 1/2	+6.8	O	BARRY WRIGHT	14-34	23 1/4	+ 1 1/2	+6.8												
O	CYBERNETICS INC	1- 1	1/4	+ 1/4	+8.3	O	CYBERNETICS INC	1- 1	1/4	+ 1/4	+8.3												
O	DUPLEX PRODUCTS INC	13-31	26 1/2	+ 1/8	+0.4	O	DUPLEX PRODUCTS INC	13-31	26 1/2	+ 1/8	+0.4												
N	ENRIS BUS. FORMS	3-21	16 3/4	+ 3/8	+2.7	N	ENRIS BUS. FORMS	3-21	16 3/4	+ 3/8	+2.7												
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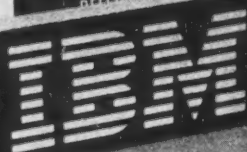
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